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The Jackson Lecture.[1]

LAND, LABOUR AND GOLD: THE MEDICAL PROBLEMS OF AUSTRALIA IN THE NINETEENTH CENTURY.

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Melbourne.

When the country is bare, not fenced, and rugged, blasted by the winter and scorched by the sun, there you may see the men hardy, slender, with well-shaped joints, well-braced and shaggy; sharp industry and vigilance accompany such a constitution; in morals and passions they are haughty and opinionative, inclining rather to the fierce than to the mild; and you will find them acute and ingenious in military affairs; and likewise all the other productions of the earth corresponding to the earth itself.

—Hippocrates, *On Airs, Waters and Places,* translated by Francis Adams.

I REGRET very much that I had not the opportunity of meeting Ernest Sandford Jackson, but his historical papers are very familiar to me. I first encountered his name some years ago when I read a masterly account of the early voyages to Australia; it was the first Ernest Sandford Jackson Lecture, and it was given by Dr. Sandford Jackson himself. It occurred to me then that it was a magnificent gesture on the part of your Association to honour a man in his own lifetime in such a manner. Bernard O'Dowd, personifying History in characteristic fashion, wrote:

> Chaotic annals feel my breath,
> Creative, warm their clay;
> I read from hieroglyphic Death
> The text you need today.

This means of commemorating his name and work must have had a special appeal to him, because he, perhaps better than most of us, could see the ultimate value, "the text", of a series of lectures on a variety of subjects whose only feature in common was some historical perspective. The many who have derived pleasure and profit from the addresses given since 1931 are deeply indebted to Ernest Sandford Jackson and to the founders of this lecture. Thus, it is with an acute awareness of the significance and extent of this debt, born of the first memorable address, that I express my appreciation of the honour of your invitation to deliver this lecture in your Centenary year.

The medical history of an era cannot be isolated from the social, economic and environmental factors which largely determine it, although for the sake of simplicity we frequently attempt to do so. The dominant factors

[1] Read, slightly abridged, at a meeting of the Queensland Branch of the British Medical Association on October 2, 1959.

in Australian socio-economic development in the nineteenth century were, to borrow a phrase from the title of William Howitt's book, land, labour and gold. I propose to try to link these to the health of the community and to its medical practice and practitioners. On the whole I shall allow contemporary writers to tell their own story; I shall not attempt a critical analysis, although the material is critically selected, nor shall I survey the specifically medical literature or public health statistics, although both would add a little to the story. I shall also largely ignore the impact of economic factors on the established centres of settlement.

I shall refer chiefly to the eastern colonies, but similar socio-economic phases and conditions were encountered in all the colonies at various times.

Economic Development.

Land.

It is convenient to take up the story of Australian economic development in the 1820's, a period of particular significance in Australian history. The concept of a purely penal settlement was beginning to disappear, both in Australia and in Britain. Governor Macquarie's vision of the future seemed justified as the wool industry became established and the colonists broke out into the plains beyond the Blue Mountains. His recognition of certain emancipists as social equals and as sociologically desirable and necessary was also justified; some of these men became leaders of the community at this period of increasing local responsibility for government.

There were other signs of progress; the Hunter River settlement was successfully established, spirits ceased to be the local form of currency, a trading bank had been set up and, on the social side, there was evidence that the native-born youth was not so prone to alcoholic excesses and vices as was the previous generation. At the same time, in England, the Napoleonic Wars had ended, there was a large pauper population, and there was public interest in emigration, whether to Canada, America or Australia. During the 1820's the annual number of free settlers arriving in Sydney increased tenfold.

In 1820 the population of New South Wales was 25,000, including 7000 children, and was made up predominantly of convicts. The social factors influencing the medical problems of this isolated community included a large, and in many instances unwilling, labour force living in unsatisfactory housing conditions on relatively limited rations, a considerable preponderance of males over females, an excessive devotion to alcohol and an extremely high rate of child illegitimacy. By 1840, the situation had changed, mainly through migration and natural increase. The population was 130,000; the males still outnumbered females by two to one, but nearly a quarter were "currency lads and lasses"—that is, locally born—and 40% were "sterling" free settlers; emancipists and convicts each amounted to about 20,000, or 15%.

The economic development of Australia over the period 1820 to 1850 hinged on the development of the pastoral industry and the provision of labour to maintain it. The small grants made to the early free settlers and to emancipists, just as many of the small selections of later years, passed into the hands of speculators and those with capital. In the 1820's grants of land were made in proportion to capital, but within a decade or so grants were replaced by land sales. Within a few more years rapid expansion of pastoral interests found so many living beyond the boundaries of authorized settlement that a "squatting" licence was introduced. By 1850 the squatters occupied all the worthwhile grazing land in Victoria and New South Wales, and, whatever the intention of the original controlling legislation, the courts had conceded some rights to the occupiers. In 1840 there were 673 such stations with a population of about 6700, half of whom were convicts.

Wool exports increased from 175,000 to 39,000,000 lb. between 1821 and 1850. However, there was no increase comparable with that of the population or of the land occupied in the acreage of wheat and other crops, because small farming was largely a failure. This pattern of failure, established in Governor Phillip's day, continued, perhaps with decreasing frequency, throughout the century, in spite of various encouragements offered to the small farmer. The reasons for failure remained fairly constant: the immense task of initial clearing, insufficient land for crops as well as stock (necessary, in an isolated settlement, for food and transport), insufficient reserves of capital and experience to combat floods, fire and drought, and remoteness from the towns with high costs of transport.

Until the middle of the century the squatter's political and economic influence was unchallenged, but thereafter it began to decrease. In the interim he had been largely responsible for the development of Australia's prosperity, and he had gained, with the rest of the country, the experience of weathering a major crisis in the early 1840's, when the price of wool fell precipitously, when wages rose in association with a labour shortage and when drought caused havoc amongst his stock. He had secured himself to some extent against any intrusion on his "property" by purchasing key points on his run—such as water frontages— so that the rest of the land he occupied was useless to would-be competitors or small selectors. In addition to his vital contribution in these formative years, he and his industry provided a measure of stability during the gold rush and its aftermath. Whether or not he acquired his land and his ultimate wealth too cheaply, the way to neither was easy; he had to pioneer both new country and new methods.

Greater development of agriculture followed the gold rush. Popular opinion led to legislation designed to "unlock the land" and provide opportunities for the small farmer. At the same time the railway permitted the latter to farm at a distance from the towns. He was by no means generally successful, for reasons already given, but he came to form an increasing proportion of the rural population, and especially as a result of South Australian efforts, he kept the country in bread. Of great importance were improvements in methods—the Ridley stripper, the "stump-jump" plough and, later, the complete harvester.

Labour.

Rural labour at first was scarce and was almost entirely composed of convicts rationed and clothed by the government. They were neither enthusiastic nor experienced shepherds or farm labourers, but free labour was more expensive, and in any case, free men preferred to remain near the fleshpots of Sydney. Nevertheless, by the late 1830's government-assisted immigration and an increasing native-born population were providing an increasing source of labour; at about this time the demand for labour exceeded the convict supply. Conflict arose between those wanting transportation to continue as a cheap labour pool and those wanting it to cease as being undesirable competition. The importance of the convicts as a labour force, as a source of revenue from Britain and as consumers of local products is indicated by the economic difficulties of Tasmania after transportation ceased and by the ultimate need to introduce convict labour to develop the colony at Perth. In spite of Wakefield's idea of selling, rather than granting, land, so that a labour force could be sent out on the proceeds with no immediate prospects of becoming capitalist landowners, the labour shortage in South Australia was for a time acute.

However invaluable convict labour had been to the eastern States, they had outgrown the need for it by 1850. It was realized that it was illogical for the Home Government on the one hand to transport convicts and on the other to assist free migrants. The former deterred free emigrants and rendered the granting of self-government difficult. Furthermore, the demand became increasingly great for skilled artisans and tradesmen, who were not to be found amongst the convicts. Incidentally, for the social welfare of the community women were desperately needed; although from the labour point of view there was at times a superfluity of ladies' maids, nursery

governesses, dressmakers and other genteel types, females of the "working class" were at a premium.

Various methods were adopted to encourage immigration of suitable persons from Britain; Mrs. Chisholm did her best to provide young women, and the duties of surgeons of the Royal Navy were at one time extended to include those of immigration agents. For a while bounties were offered to those sponsoring the immigration of suitable families. Sir William Macarthur, son of John, pointed out that one shepherd with boys of nine or ten years of age and upwards might carry out most of the work on one sheep station with three or four flocks, and even the females could be employed "with propriety"; he employed between 10 and 20 children from five or six years of age at Camden, at threepence to a shilling per day.

By United Kingdom standards, wages were reasonably good throughout the century, and especially so when the labour shortage became more acute at about the same time as transportation ceased. Labour organization, however, was severely restricted by the harsh *Masters and Servants Acts* of 1828 and 1845, and unions did not appear until after the gold rush. One of the first labour victories was the granting of an eight-hour day to certain employees in Victoria in 1856, but it was 1874 before the New South Wales coalminers were granted a ten-hour day instead of twelve. Factories developed with increasing rapidity after the 1860's, aided often by protective tariffs. There were about a thousand factories in Victoria and New South Wales in 1861, and five times this number in 1881; the proportion of the population living in rural areas decreased from 75% to about 65%. The boom of the 1880's saw not only the first measures to control factory working conditions, but also the rapid growth of trade unions and their closer intercolonial liaison. Their increased demands caused a violent reaction amongst employers, leading to the vicious labour troubles of the 1890's. The maritime, shearers' and miners' strikes make sorry reading today; perhaps their most beneficial effect was the stimulus provided to Australian writers such as Henry Lawson.

The prosperity and progress which marked the 1880's were associated with further large-scale immigration, both free and assisted. Labour was opposed to the latter form for obvious reasons; similar reasons were behind the opposition to Chinese and Kanaka labour. Since the goldfield days there had been various restrictions on Chinese entering the country. Kanaka labour, which was almost as important to northern Queensland as the convicts were to New South Wales, ceased largely because of allegations of exploitation and maltreatment, and there was also evidence of an excessively high mortality rate.

Gold.

The discovery of gold in New South Wales and Victoria in the first years of the fifties came at the end of an era. A large measure of self-government was granted to the colonies; convictism was in the main outmoded as a means of disposing of excess population or of providing labour; the growth of democracy was indicated by the failure of attempts to revive transportation in the face of popular opinion to the contrary; prosperity derived from local industry and not from money spent by the British Government on the maintenance of its criminals. Even the system of assigning convicts as servants ceased, admittedly mainly because it was considered to be an inadequate form of punishment. Indeed, the stories of easily won gold made transportation to the eastern colonies useless as a means of punishment.

The first economic effect of the gold discoveries in Victoria was the desertion of the towns to such an extent that private and government business could scarcely be carried on. The second was a vast influx of immigrants from other colonies, as well as from Britain. A severe labour shortage was thus created throughout Australia, and prices rose to fantastic levels (Table I); little is heard of the poverty and misfortune caused to those who were unable to participate immediately in the goldfields' wealth. Luckily from several points of view the goldfields were reasonably accessible from the main towns and situated near reasonably fertile country. It was fortunate, too, that they had a reasonable water supply, although temporary shortages often held up the process of washing dirt, and thus led to rapid fluctuations in the size of the local labour force.

Into these extraordinary conditions over 100,000 persons precipitated themselves so that within two years the population of Victoria was increased by about 140%. The population had increased sevenfold within another decade. Even in the short-term view, the assimilation of this multitude without wholesale famine and distress is amazing; in the longer view, their absorption into an era of comparative prosperity and stability immediately afterwards is little less remarkable. There was a fall in prices and wages, and an increase in unemployment after the surface alluvial gold had been exhausted in the first few years, but the wonder is that there was no worse depression. Some of the economic factors involved are summarized in Table II.

TABLE I.

Approximate Price Increases in Melbourne[1], *1850 to 1852.*

Commodity.	Percentage Increase.
Basic foods (meat, bread, flour)	100–400
Potatoes	400–500
Vegetables, fruit	100
Dairy produce	100–200
Groceries	25– 50
Drugs	20
Tobacco	300
Beer	50
Firewood	600
Horses, hacks	150
Wages, labourer:	
Unskilled	300
Skilled	500

[1] Rises in other capitals were usually less. Goldfields prices were higher and subject to variation with state of communications: carriage from Melbourne to Bendigo (100 miles) reached £120 per ton in the winter of 1852. Prices were falling by about 1855, and were becoming stable by about 1861. The goldfields doctor's bill, for example, was halved over this period; wages also fell. The figures are from various sources.

TABLE II.

Stabilizing Economic Factors During and After the Victorian Gold Rush.[1]

Factor.	Change.
Wool price	100% increase 1851 to 1861.
Wool export	17% increase 1851 to 1861.
Agriculture	300% increase in acreage 1853 to 1858.
	150% increase in farmers 1854 to 1858.
	250% increase in employed farm labourers, 1854 to 1858.
Coal	540% increase 1850 to 1860.

[1] Dairying and vegetable growing became more profitable. Manufactures, commerce and public works all increased after 1855. More static mining population and reduced emigration after exhaustion of alluvial gold about 1858. These factors did not prevent some depression in the early 1860's, but there was none of the economic crisis or financial panic that occurred in the 1840's and 1890's.

The political effects of the gold rush are summed up in the existence of universal manhood suffrage and a secret ballot in the main Australian colonies by the 1860's, years before either was employed elsewhere. This extension of the franchise allowed popular opinion to gain legislative expression, notably in the moves to break the political dominance of the squatter and to release his land to small farmers. Born of this influence and of a certain amount of necessity, the Australian tendency to turn to the Government for legislative aid in all sorts of difficulties was nurtured.

One relatively minor effect of the discovery of gold was the annihilation of a profitable industry which had helped save the pastoralists from extinction in difficult years: the boiling-down establishments closed as the price of sheep rose fourfold with the demand for food.

Of the economic situation of the miners themselves it may immediately be said that comparatively few made their fortunes, but it would also seem that most eked out some sort of a living. Many soon realized that gold-digging was a somewhat chancy occupation, and took to carrying water, foodstuffs, grog or other essential supplies, or to bakery, butchery or quackery. It is likely that these wiser gentry gained most from the gold rush. By the 1860's most of those remaining on the fields were working as employees or as members of a syndicate in deep mining; crushing of quartz became a new occupation.

The subsequent development of agriculture and industry, aided by an increase in commerce and public works, absorbed the excess diggers once the surface gold was exhausted; the rapid expansion of the eighties followed a relatively uneventful decade or so. In spite of the labour difficulties and the major economic depression of the early 1890's, the last decade of the century saw the wool clip increase, the wheat acreage and yield grow larger and dairy products and frozen meat become exports, and, indeed, the whole pattern of economic development over the next fifty years became apparent. The Commonwealth of Australia came into being at an auspicious time.[1]

Outback Medical Problems.

The chief characteristic of outback medical practice was the problem of isolation and distance. This imposed its own problems from the doctor's point of view. The situation is well summarized by a clergyman (Morrison, 1876):

> The want of medical attendance, one is very apt to suppose, must be severely felt in the thinly populated pastoral districts . . . ; however, an arrangement is often entered into by contributing a sum of money in the shape of a bounty for the residence of a medical practitioner. There is also a fair sprinkling of individuals who have some knowledge of medicine and surgery, who can prescribe in cases of emergency; whilst there are few of the squatters who are not provided with a "medicine chest". One regularly qualified medical practitioner acting as superintendent of a cattle-station, incidentally mentioned . . . . that he had taken the situation because he could not conscientiously charge the fees which other medical men were doing—fees which appeared to him to be little better than robbery of unfortunate people.

I am not sure how often a doctor was privately subsidized to practise in remote areas. The South Australian Company offered a minimum guarantee, and an official Company letter of 1839 points out that

> as the Company are bound to make up to Dr. Harvey a certain sum half yearly if his practice does not yield it . . . Mr. Hare must not interfere . . . in other words . . . must in the meantime discontinue his medical practice.

Occasionally, therefore, a system such as this would serve to limit competition, or in modern medico-political jargon, interfere with the patient's right to a free choice of doctor.

There are many instances of squatters acting as medical men, and it is not surprising that some of them were rather unorthodox. Captain Brentwood in *Geoffrey Hamlyn*, was an amateur homœopath while

> W. [a squatter] . . . is an enthusiast in mesmerism, and tries every night on a rheumatic servant, bent down with disease; hitherto unsuccessful,—certainly not from want of faith in the operator, who was in a state of high excitement—indeed, much more affected by the process than the patient, who seemed quiet, stolid and unmoved under the mystic passes. This was the eighth night, and he devotes one hour to it. (Wathen, 1855.)

Hawdon, leader of an expedition from New South Wales to Adelaide in 1838, records that he twice bled an injured man with benefit.

On the question of fees, the clergyman gives a specific example.

> A mere lad, from a medical school in Scotland, who had come to Australia to make his future, went in to the interior on a professional tour, and he told the writer with some glee, that he had charged, and had received, fifty pounds for one visit to a family. The family was rich—a squatter's one—and could afford to pay this very high charge; but this was not the case with working people, one of whom, an industrious mother of a family, I knew to have been charged eleven pounds by the same lad for one visit to her sick husband, and she had to sell her cows before she could pay the sum demanded. The unscrupulous Scotsman rated his income at fifteen hundred pounds per annum, and he retired, after a few years' practice, with a fortune. With an equal population in Scotland, he would not have received fifteen hundred pence.

The author is sufficiently impressed by the isolation from and expense of medical treatment to use these points as arguments against permitting too wide a scatter of the population.

On the other hand, from the doctor's point of view life was not easy. The population was composed mostly of healthy young adults with a distressing tendency to remain well; it was twelve years after the first settlement at Bathurst before the first death from natural causes occurred (Cunningham, 1827). A doctor wrote in the *Medical Times and Gazette* in 1858 that

> the interior of the country, being deficient in that large middle class which contributes in all long settled countries the chief support of the Medical practitioner, offers very little inducement to anyone wishing to improve his position, the risk being great and the success limited.

A distinctly idealistic conception of an Australian "rural village" is revealed in the following passage (Lancelott, 1852):

> Most of the villagers are British or German peasants, and their ambition being not great, their wants few and more than supplied, they are happy . . . . Disease is scarcely known among them, so much have their originally sound and robust constitutions been invigorated by their healthful mode of life and the climate . . . . They are not fond of learning; their schoolmaster can scarcely distinguish substantives from verbs; their doctor, fevers from bilious attacks . . . .
>
> Many of these villages are just such retired romantic spots as the poets tell us are the dwellings only of virtue and contentment . . . .

The frank account of a doctor's dissatisfaction with this type of practice set out in *The Confessions of Wavering Worthy*, written by a surgeon, is probably authentic (Wardley, 1864):

> Nobody would fall sick enough to go to the expense of a doctor; I had difficulty in getting money in some cases where I had . . . dearly earned it . . . . You never had any leisure, though you could not get a sufficiency of business, but your time was occupied, and your energies half expended, by the rough expedients you had to resort to to keep yourself decent and in working (medical) condition. I could not afford to keep a servant, and was much incommoded and irritated by the time . . . and the labour of catching my horse . . . . I did not like the huge distances of hard riding I had to perform . . . the continual peril to life and limb . . . and the perpetual liability, to one unacquainted with the country, of losing his road.

One's imagination, if not a nodding acquaintance with nineteenth century Australian literature, suffices to provide illustrative examples of the hazard of isolation in the event of accidents or acute disease. However, a contemporary author (Jessop, 1862) reminds us that it is unmanly to consider this question

> which undoubtedly savours more of woman's foresight than of a man's courage, and must necessarily be overridden in a career of enterprise.

This "woman's foresight" doubtless led her also to envisage childbirth in the lonely bush, a circumstance in which a man's courage is not necessarily of much practical value. The paucity of specific accounts of this event

[1] At this stage a series of slides was shown to illustrate living conditions in the outback and on the goldfields during the nineteenth century.

which I have found suggests that childbirth was regarded as just another natural function, in spite of the relatively high maternal and infant mortality: medical attendance was "in the category of non-essential luxuries"; although occasionally an expectant mother took lodgings in a town to be near a doctor, "the majority of Bush women preferred to stay at home and make shift with the peripatetic Gamp, old and unscientific as she always was" (Cambridge, 1903). But one plaintive and, in the circumstances, justifiable cry escapes from the past, and that from the Moreton Bay district in the early 1840's, as described by Mrs. Campbell Praed in 1902:

> "Having neither doctor nor nurse" the young [and ill] mother writes, "and knowing that I might die before there was any hope of medical assistance, I endeavoured to prepare my mind for leaving this world". Poor little bride of nineteen.

The women had another major worry, for amongst the several causes of a high child mortality was loss in the bush; it is not surprising that the subsequent feeling of guilt made mental wrecks of some of the mothers. There are some interesting facets to this important cause of child mortality: the long distances the children travelled, the rapidity of their disappearance, the fear (apparently) which made them hide from searchers, or at least not answer their calls. There are many authentic accounts of these tragedies, but one of the most fascinating was written from the child's point of view by Marcus Clarke in 1896.

Isolation, whatever its disadvantages, at least tended to limit the spread of diseases such as typhoid fever and dysentery. On the other hand, overcrowding and primitive conditions in the one-roomed or two-roomed huts ensured the spread of sickness once established in the family (Backhouse, 1843):

> Many people in the neighbourhood were affected with fever, which was so prevalent that it had obtained the name of Influenza . . . . In one family . . . the father, in a state of high fever, was in the same bed with two of his own children. The crowded state of some of the huts of the poorer settlers, renders them extremely uncomfortable in times of sickness.

In the early days the squatter's home was little better than the shepherd's hut,[1] although he commonly added another room or two before the family arrived. Flies and vermin were attracted by the sheep in their compounds close by; fleas were almost equally common.

> One of the singular attractions which Australia presents, is the asylum which it provides for persons who are incapable of manual labour.

This observation by Morrison (1876) was precipitated by reflection on the "indolent occupation" of shepherd, and the still lazier one of hutkeeper. These tasks could be done by man and wife, and the labour was still less arduous if, as in the recorded case of Michael and Bridget O'Brady, there were many children to do the shepherding. However, there were occupational hazards, namely lunacy, suicide, alcoholism and malnutrition. "Queer" shepherds and hutkeepers abound in our literature, perhaps partly because the light work attracted the elderly and those otherwise handicapped, and partly because of the loneliness, the monotony and, again, the food and the liquor. Even in later years, many were former convicts who were distinctly "antisocial" (Pechey, 1867). Dr. Bateman, in Rolfe Boldrewood's *A Squatter's Dream* observed laconically: "Man drowned last night—inquest . . . shepherd, of course: shocking amount of lunacy amongst them." His evidence may be corroborated from more authentic sources; gunshot wounds and hanging were the common techniques. Dr. Bateman implied that the frequency of such events influenced employers to fence their land and so dispense with these "expensive luxuries", but this was more particularly the result of control over the aborigines and dingoes, the lack of necessity under Australian conditions for nocturnal yarding of the sheep, and the labour shortage and costs of the gold rush era.

Living conditions in these outstations were extremely primitive, but doubtless in many instances, particularly in the early years, so were the inhabitants; before the formation of the border police (1839) they lived in a "most lawless and barbarous state", according to H. W. Bunbury, writing some years earlier. They received about eight shillings a week plus rations, and their only incentive was in odd instances a bonus for a lambing rate of over 80%. Some of their wage was payable in kind, with a margin of profit to the employer, and notably in spirits. The latter issue prevented the isolated employee from exchanging a sheep or two for crude liquor from itinerant pedlars, and was also economical of working time in that it saved the employee wandering up to thirty miles to a shanty; he could have his debauch on the spot (Cunningham, 1827). Contrary to general belief, today's claims for workers' compensation for events occurring in the hotel on the way home are thus seen to be based on a principle established by the employers, not the employees.

Another occupational hazard, confined to the convict labourers, was flogging, a means of punishment for even trivial offences which was easily arranged and produced little loss of working time. Between 1830 and 1837, 42,000 convicts were flogged, the average sentence being 45 lashes. Surgeon Cunningham felt that the frequency of the punishment led to a loss of its deterrent effect. Other occupational casualties were due to falls from horses, drowning while crossing flooded rivers and sometimes murder by aborigines (although this was less common than the reverse process).

It would, of course, be wrong to imply that all those working in remote areas were unsatisfactory types, and no more appropriate illustration can be given than that of a physician forced by economic necessity in 1841 to take up such an occupation (Mrs. Alfred Watts, 1882).

> The gentleman in question was a well-educated man, an Edinburgh physician, and yet such was the difficulty of procuring suitable employment that he had been compelled to hire himself out as a shepherd, and was then engaged in minding a flock of sheep for the [South Australian] Company. After a ride of ten or twelve miles in the noon-day heat, they espied him returning to the hut for his dinner, surrounded by his charges, and dressed in the flannel shirt, moleskin trousers, and cabbage tree hat normally worn by bushmen. The wigwam which he invited them to enter was as clean and neat as possible; the kettle was boiling upon the fire, some chops were fizzling in the frying pan, under the hut-keeper's supervision, and two tempting-looking mutton hams were going through a course of smoking up the chimney. On a shelf in one corner lay a few books, together with some cases of medical instruments, and we must not forget to add that a strong odour of tobacco pervaded the apartment. Notwithstanding his rough dress and uncouth surroundings it was plainly perceivable that the bush doctor was a gentleman, and was occupying a position much inferior to the one he was by birth and education entitled to.

Goldfields Medical Practice.

If isolation dominated the medical problems in pastoral districts, overcrowding in primitive living conditions was responsible for the chief medical hazards of the goldfields. Typhoid fever and dysentery produced a heavy mortality, the extent of which it is now difficult to estimate (Read, 1853).

> Nothing but bad accounts seemed to arrive from the diggings—heat, flies, dust, water scarcity, stuff needing washing had to be carted nine miles, hundreds dying of dysentery and thousands almost blind with sandy blight . . . .

Or again:

[1] I hope that some of the few remaining examples of these early dwellings will be preserved. Their construction and the materials used in them, which varied widely according to local conditions, are of considerable interest and the huts themselves are of far greater significance in Australian history than the sprawling station homesteads which succeeded them or the few "stately homes" of the cities, historic though these may be. Appropriate use of original facades or replicas, made from extant directions, and selected interiors should form the basis of an attractive indoor folk museum to be established before it is too late.

> Scarcely any have mentioned, except casually, the name of the demon "Dysentery", that is now stalking abroad through the diggings, breaking down with ruthless arm the stout and sturdy, and bending the weak and puny to the dust, giving them graves amidst the soil charged with the golden dross they so much coveted and in search of which they have lost their lives.

This, believe it or not, is your *Argus* correspondent, quoted in *Australia As It Is*, by F. Lancelott (1852).

Information concerning personal and public hygiene on the goldfields is scarce, although Saturday afternoon was by general consent apparently a day of "cleaning up" (Boldrewood, 1891). As with early Sydney, there seems to be no record of the means of disposal of human excreta. A hint as to the method may be found in the statement (Read, 1853) that flies were

> attributed in a great measure to the butchers, the offal from the slaughtering yards being thrown about, or tumbled into a deserted claim . . . . During the time I was there, no orders or regulations existed . . . for the prevention of such nuisances; or if there were, there was no attention paid to them.

Disused shafts were often only "disused" for a few days or hours in the earlier years. In regard to the water supply, which obviously varied with the locality and the rainfall, it is known that certain wells were designated for domestic use (the minority) and others for the all-important purpose of washing dirt. However, the presence of mineshafts together with numerous wells sunk too close together in uncontrolled fashion meant that the springs frequently became exhausted (Lancelott, 1852), and doubtless readily polluted.

On the other hand, an excess of cold water also brought its troubles on the Ovens goldfields, near the Australian Alps (Read, 1853).

> To get at it [gold] you had constantly to be in the water, consequently bringing on severe colds, rheumatisms, etc., etc. I regret to see the papers mentioning the names of several respectable people, who died from the effects of exposure; and, doubtless, many others have gone to their last homes . . . their mates . . . [having] . . . put them betwen two pieces of bark and popped them into the first hole that was vacant, without any further ceremony, never even knowing their name, beyond Jack, Tom, Harry . . .

Indeed the goldfields were not the place for "pale-faced clerks from London or Liverpool" or for "sons of poor gentlemen . . . delicately brought up" (Wathen, 1855). In seeking a colleague on the goldfields (Lancelott, 1852)

> avoid shepherds and stock-keepers, and professional men; for the former, although used to roughing it, have an unconquerable antipathy to continuous labour, and the latter are mentally and bodily unfitted for so hard and precarious a life.

Medical testimony to this effect is given by Wavering Worthy (Wardley, 1864):

> Instead of getting physically more enduring . . . we got weaker, and felt the exhaustion of toil both more quickly and more distressingly than . . . before, and it began to show visibly in our hollowed cheeks and emaciated bodies. Rheumatism racked our bones and sinews and stiffened our joints; our appetites failed . . . .

Dr. Worthy and his friend went into the profitable business of brewing beer instead, affording another instance of the versatility and resource which are traditionally associated with the Australian general practitioner.

Judging by the conflicting accounts available, success or failure of a goldfields doctor, professionally and financially, was as much of a lottery as digging. Genuine doctors were in competition with a host of quacks, with adventurous former medical students and with surgeons' or apothecaries' apprentices, with drug and nostrum pedlars, and with purchasers of academically valueless European diplomas. Medical registration and legislation were ineffectual; even a medical certificate of death was not required. Fees were stated to be high or exorbitant in relation to the services rendered (Howitt, 1858), and it was said that "a surgeon will not visit a patient under from two to five guineas" worth [about an ounce] of gold dust (Lancelott, 1852). That this is not true, and that diggers were often seen for a few shillings, is clear from the diary of one of these surgeons, James Selby. Although a lucky digger would pay a fantastic fee without thought, the majority of the goldfields doctors probably made no great profit and indeed no more than a living. On the other hand, from a Queensland goldfield in a later era (1877) Dr. Joseph Little wrote to the secretary of the Medical Society of Victoria:

> Although one makes money on a Gold Field he loses caste. The only case of interest I have had was a lumbar abscess pointing in the groin, on which I used the aspirator with complete success . . . many men assume degrees in these out of the way places they have no claim to. . . .

Apart from the diseases mentioned, the most characteristic feature of goldfields practice must have been accidents "from preventable causes", which were of "everyday occurrence" (Patterson, 1863). Shafts, perhaps often inexpertly sunk and timbered, caved in, winding gear broke, men—and children, too, for years after the gold rush had passed—fell into disused shafts. Explosives, the entry of water and inadequate ventilation later constituted additional hazards. An interesting occupational injury was fracture of the nasal bones caused by the windlass if a miner's grip should happen to slip. The mortality rate for accidents was high; over 50% of the victims reaching the Ballarat Hospital died of their injuries. In the 1880's, mining accidents accounted for three deaths annually per 1000 miners until greater precautions were taken in the last decade of the century (Walter Summons, 1907). Accidents were certainly more frequent prior to this, and many were of a bizarre nature; one man had his nose bitten off and swallowed (Read, 1853). Although the Australian goldfields had a reputation for their essentially law-abiding nature, there were many areas into which it was better not to venture. There were murders and there were fights; even two doctors, quarrelling over the origin of hydatids (and perhaps a woman), fought a duel with pistols; scalpels were rejected, as the contestants might have been too "fatally proficient" with these weapons, according to the *Medical Record of Australia* (1861). There were more peculiar "accidents", such as the case of a woman found dead in bed in a pool of blood, but with no blood on her hands, who was found to have died as the result of the passage of two candles into the peritoneal cavity *per rectum*; was it murder, suicide or accidental death? Reference to the *Australian Medical Journal* of this period (1863) reveals many instances of "accidents" and "misadventure due to the ministrations of would-be surgeons and midwives"; medical litigation was both frequent and unedifying.

Of the later developments on the goldfields, unquestionably the most significant was the introduction of the machine rock drill. Deaths from phthisis amongst adult miners in Bendigo were six times more frequent than among all Victorian adult males at the turn of the century. There were 13 deaths from phthisis per 1000 living miners, the average age at death being about fifty years; the deaths from respiratory disease generally were 20 per 1000 amongst the miners and four per 1000 in Victorian adult males. The mortality rate from phthisis in Melbourne had fallen by 25% between 1890 and 1900; conversely, Bendigo mortality, after a transitory fall, had increased rather more. The fact that even in the early 1870's the phthisis mortality rate for adult males was over 50% higher in Bendigo than in Victoria generally suggests that silicosis may have been significant even before machine drilling became common; "miner's complaint" as such does not appear in the Bendigo death register until 1887. These observations are based on the excellent reports made in 1906 and 1907 by Walter Summons, who at the same time expressed amazement at the reluctance of the miners to use a water jet with the drills. Conservatism is not confined to the ruling classes.

It is of interest that as early as 1851 two surgeons were employed at the highly successful Burra Burra copper mines by the South Australian Mining Company. Some years earlier it was noted (Wilkinson, 1848) that

> the surgeon [at Burra Burra], although well paid by direct stipend and monthly or occasional contributions, had evidently no sinecure, and finds it necessary to hold himsef in constant requisition, as he appears to do with all conceivable suavity.

Many of the miners both worked and lived underground, for they dwelt in caves in the bank of the creek; though rude, these effectively shut out the direct rays of the summer sun (Lancelott, 1852).

Some Medical Problems Encountered in Rural and Goldfields Practice.

Some problems specifically associated with either rural or goldfields practice have already been discussed, but mention may be made of certain conditions occurring in or affecting both types of practice. These conditions warrant more detailed and critical study than I can attempt here, but it is worth pointing out that neither the medical nor the lay literature alone will give an accurate picture.

The influence of the vagaries of the Australian climate on the health and well-being of people from Britain living in primitive or open-air conditions needs no emphasis, and one authority sensibly advocated a period of acclimatization in Sydney before proceeding inland (Lancelott, 1852). Men who got lost—and it is not surprising that these were many—died a horrible death from thirst. Perhaps a psychiatrist can explain why a late symptom or sign, common to nearly all the many descriptions of this tragic event, is nakedness; after this came the ants. Other accounts indicate that many died of thirst after leaving a shanty after a spree, an understandable paradox; others died in delirium tremens (Jung, 1884). The modifications of European clothing and habits of dress and the early development of showers in Australia are other interesting facets to the problem of adaptation to climate.

Alcoholism was undoubtedly too common, but its evil effects were enhanced by the quality of the brew supplied. One variety sold "on the sly" on the goldfields was known as "Blow-My-Skull-Off". Served at half a crown a glass, it was composed of cocculus indicis, spirits of wine, Turkey opium, cayenne pepper and rum (Read, 1853). There are also tales of adulteration, possibly by wood alcohol, of "hard" liquor by unscrupulous shanty-keepers in rural districts. The reliable Quaker observer, James Backhouse, describes dispassionately the alcoholic habits of the colonies (1843); one settler was formerly addicted to the use of spirits, till, like many others in this country, he would bring rum home in a bucket, and drink it neat out of a pint tin. This, his wife would not allow; he ultimately reformed. In the face of drinking of this kind the undesirable prevalence of delirium tremens, cirrhosis of the liver[1] and insanity during much of the nineteenth century is readily understood. Although this statement could be easily supported by reference to the medical literature, it is but fair to add that there were protests against the extravagant contemporary accounts of Australian drinking habits. Indeed, this is probably the only point on which Tom Collins (1943) would allow that his more romantic predecessor, Henry Kingsley, showed a little insight.

Malnutrition conceivably played a highly significant role in the medical history of both the goldfields and the pastoral districts. From the point of view of the selector, Professor Wadham has pointed out that in Australia, as opposed to Europe, the small farmer's period of shortage was in summer rather than winter. Consequently, storing food over the time of shortage was difficult or impossible. The risk of malnutrition, not necessarily manifest in florid syndromes, was thus enhanced, perhaps leading to "gradual loss of energy and mental poise" which "would automatically destroy that spirit of mutual forbearance essential to successful family life" (Wadham, 1947). Steele Rudd's "On Our Selection" is not merely a masterly study in the humour of stark tragedy, but a revealing sociological document, not least as regards the monotonous diet of these pioneers. Diet on the station homestead was little better (Wathen, 1855), although there was always an abundance of meat, even if it had to be sewn in a white bag to prevent the ants eating it first (Jessop, 1862), or went rapidly green or maggoty. The stations were often isolated by floods (Praed, 1902): "The store was empty of flour, tea or sugar, so that we had to live on mutton and pumpkin for many months." Beef and mutton were usually reasonably cheap on the goldfields.

The rations for convicts, shepherds, shearers, farm labourers and employed miners varied little throughout the first seven or eight decades of the nineteenth century. It was supplied as part of the wages by the employer, and consisted, per week, of a minimum of 7 lb. (more usually 10 lb.) of beef or mutton, sometimes salted pork, 7 to 10 lb. of flour, 2 lb. of sugar (usually black), and a quarter pound of tea (usually green). This was all, and in many situations there was no prospect of obtaining more. Sometimes there was less; tea, sugar and tobacco were sometimes indulgences which the employer might withhold. Occasional employers supplemented these rations with such items as butter, cream, bread and eggs, but the men might then complain and use the butter to grease their boots, as was described by G. Wilkinson in 1848. Presumably fresh vegetables were made available whenever possible, for the prevalence of "land scurvy" was obvious to the layman. Shepherds and drovers were perhaps the most frequently affected. Dr. Pechey, in 1867, stated that at the height of the recent droughts "my practice was almost confined to scurvy patients, and as, from the want of grass, bullock teams were unable to travel, the whole of the far interior was short of rations . . . ". This drought lasted some years, so that even the succulent, but unpalatable, local plants which some shepherds ate were not available. A familiar figure on the goldfields, on the squatters' stations and in the vicinity of the towns, the Chinese digger turned gardener became an important influence on the Australian diet and thereby on health. Largely as a result of his efforts, the price of vegetables fell precipitously about 1860. He performed "marvels in the art of the kitchen garden", but it may also be pertinent to note that:

> . . . he is great in the use of liquid manure, and near his garden-gate at all times, long rows of peculiar round long-necked pipkins are to be seen. . . . These [he] . . . circulates throughout his neighbourhood when empty, and recovers when full, and, with the help of the river water to thoroughly disseminate this manure about the roots of his plants. . . . (Patterson, 1863.)

Rheumatism, often severe, is one of the commonest disorders mentioned in lay accounts of country and goldfields districts; it was usually attributed to living out in the open, cold nights after hot days, evening dews and persistently wet clothing. Perhaps this relationship to exposure is less often apparent today because of generally improved living conditions; it is common in Antarctica (P. G. Law, personal communication) and I encountered it amongst soldiers in Korea. Perhaps, too, it was related to scurvy, as was "Barcoo rot", a condition characterized by indolent sores following trivial abrasions and wounds (Pechey, 1867). However, there were those who escaped these troubles. Bunbury (1930), an experienced traveller, said:

> Let those who will laugh at precautions or abuse smoking, but I am sure I am indebted to tobacco and woollen clothing for my total freedom of colds or rheumatism in the bush in wet weather.

A major scourge in all the newly settled and remote areas was ophthalmia or sandy blight (Read, 1853):

> In the second week of January I was attacked with the sandy blight and in a couple of days was almost totally blind; the agony was dreadful, and I could not obtain relief from any remedy; I was moreover tormented with flies, which together with intense heat inside an unlined calico tent . . . rendered my situation most miserable; after bearing it as well as I could for a fortnight, I determined to undergo any operation

[1] It is interesting that this condition was common in view of the protein-rich diet certainly consumed by the same class of people.

that the faculty could suggest, and submitted to have both eyes scarified, which afforded instant relief, and as soon as I could see properly . . . wished good-bye to my friends and the Turon diggings.

Mrs. Praed wrote in 1902:

> It was a particular kind of fly which caused sandy blight, and drove shepherds in their huts and women in the head-stations blind and wild with the pain while it lasted. Those dark-lashed blue eyes of the girl-wife . . . became contracted and watery, and spoiled by reddened lids, and thinned lashes from the frequent use of lotions. For two years she had to live in a room from which every particle of light had been excluded by hanging up blue blankets over the windows. . . .

Contemporary writers sometimes distinguish between a condition predominantly involving the lids and another more painful condition affecting the eye itself (Morrison, 1876):

> Veils do not seem, however, to form any protection against the "sand" and "swelling blight" . . . to which some persons, at this season of the year, are liable to be affected. The "sandy-blight" is so named from the painful sensation as sand in the eyes; the "swelling blight" is not painful, and is attributed to the sting of a small fly. They are both likely to be occasioned, however, by the dry, parched state of the atmosphere during the continuance of hot winds. They do not continue long, and are easily remediable.

One effective remedy, according to James Backhouse, writing in 1843, was "a greatly diluted solution of nitrate of silver, which is a remedy only safe in the hands of a skilful person".

A distinction was also drawn between an acute condition and a chronic one (Boldrewood, 1891):

> This malady [ophthalmia] . . . must not be confused with the sandy blight. The latter is acute; the former, chronic.

This statement also indicates the difficulties of interpreting correctly the terminology used.

Recent work (Mann, 1952) suggests that this condition was predominantly trachoma, often aggravated by dust and secondary infection. If this is the sole explanation, its epidemiological behaviour seems odd. Why was it a mild disease in the early years "more troublesome than severe . . . and generally very easily remediable" according to Cunningham, writing in 1827, and a severe one, often with a chronic phase, by the middle of the century? Why did it break out in small, remote and isolated communities, although admittedly it reached epidemic proportions on the goldfields? A former hypothesis, based on its prevalence in remote areas and its disappearance as conditions became more civilized, was that impaired nutrition was a factor (Barrett, 1941; McCallum, 1926). Without denying the possibility of both the above contentions—and the evidence for the former is good—I believe that more than one condition is required to explain all the accounts which we possess.

Of topical interest is the fact that Australians, by English standards, became rapidly addicted to smoking. "All the lower classes" were "determined smokers" before 1830 (Cunningham, 1827), while another author (Wilkinson, 1848) observed that the pipe, usually smoked only in the evenings at home, was smoked any time and often in the colonies. A new clay pipe in Melbourne cost a halfpenny, but could be sold for ten shillings once it was black from constant smoking.

In spite of the controversy over snakebite and its cure, accidents of this type were less frequent than might be supposed; snakes in the layman's literature appear as nuisances much less often than mosquitoes. The following passage seems to be a fair statement of popular opinion (Nisbet, 1898):

> I have known a man to be laid up for six months in hospital through the bite of a spider; for that matter I have seen people taken to the hospital from the effects of mosquito biting; but cases of this kind, like cases of snake, centipede and scorpion bitings, are very rare, considering the number, variety of the species and the chances they constantly have of exercising their venom.

Finally, a striking feature of the diary of a doctor, Robert Ewing, in a remote and newly opened-up area in Victoria was the prevalence of venereal disease or its sequelæ.

Of all the unrest and uncertainty, of the gamble not only for wealth but also for health, which attended the first decade of the second half of the nineteenth century, there was born a national character. Gone were the fresh English complexions, except perhaps of the Tasmanian maidens, and the pale, haggard faces; but with their departure there came a more powerful, though lean, physique, and some peculiar vowel sounds (Wathen, 1855; Jung, 1884); in Sydney, at least, the women were not even "passable" in looks, and the men "positively ugly". There was also evidence of an altered temperament and philosophy, but it is today difficult to know which of the varying accounts to accept. Perhaps the most significant evidence of change in this direction is the following anecdote of an event which could not have happened in nineteenth-century England, and which perhaps indicates an early phase in the development of "Digger humour" (Read, 1853):

> In the coach on the way to New South Wales goldfields, was a drunken doctor just landed from an emigrant ship . . . who having on a new pair of knee boots, was asked how much he'd take for them, whether he ever *had* paid for them, if he had not stolen them, and how kind it was of his mother to look out for his keeping his feet dry; he being . . . not accustomed to Colonial *chaff*, got into a most furious rage, which caused more delight amongst the mob.

From it all, too, there emerged another character not without sociological significance (Gandevia, 1957) in the years to come, described by Morrison (1876):

> Those who continue to lead a wandering and unsettled life . . . are apt to become so entirely changed in character as to be almost unfit for any settled occupation . . . they are restless and dissatisfied—locomotion, like some poisonous ingredient instilled into their veins, infects their whole constitution of mind and body. . . . There are chances waiting them yet; they must go, will go, and would continue going until the end of . . . this earthly existence. . . .

The General Practitioner.

In this country, pride in the status and standards of the general practitioner became part of our medical tradition. Australian general practice, particularly prior to the advent of modern methods of transport, had certain characteristic features which make its history of some significance in the study of the evolution of medical practice the world over (Gandevia, 1957). In these circumstances it is sad that we possess so little first-hand information on the general practice and practitioners of the nineteenth century, whether on the goldfields, the land or in the towns. Are there no more diaries, letters or other autobiographical material which have survived a mere century?

Before and during the gold rush professional and educated men, especially those with some capital, came to Australia to make their fortunes and then retire to the England they knew. More particularly after the 1850's, these men, usually without capital, came to make Australia their home, for better or for worse. This difference in outlook has left its mark on Australian literary development, and it may be equally significant in the history of medical practice.

Professional men were not as a rule encouraged by British or Australian officialdom to emigrate because, particularly during the middle decades of the nineteenth century many of them were forced to earn their living at any occupation which was offering; I have mentioned some examples. The following was written by Wilkinson in 1848:

> The medical men [engaged in rural occupations] . . . I have invariably found willing to do any good in their power, and some of them are living in districts . . . at a great distance from any practising surgeon, and

therefore are much in request; but they cannot depend upon physic for a livelihood.

About 1850 there was one doctor (and many quacks) to every 550 persons, approximately, in the eastern colonies. Even when gold was a major attraction, the intending medical emigrant was warned that his special knowledge would not necessarily absolve him from the necessity of doing manual labour (*Med. Times Gaz.*, 1852).

Who came, then, apart from the phthisical (Thomas and Gandevia, 1959)? Certainly many adventurous spirits, but probably not the best doctors, academically speaking, although later many eminent men in town practices were highly qualified. Admittedly, times were difficult in England and Scotland, and many newly graduated surgeons immediately entered the services. Australia was an alternative, offering at least a greater personal freedom. The private shipping companies in the 1850's were inundated with work, and their ships were compelled to carry a surgeon; they frequently took the cheapest available, and in their desperate need, acording to James Backhouse (1843), they virtually "shanghaied" a number. Certainly they lowered the reputation of the profession proper by employing unqualified persons and those of poor character. Many of these men settled in Australia, if only in some instances because they were left with no means of return (the fact that return passages were not necessarily guaranteed was not always made clear). By comparison, incidentally, the surgeons on Government emigrant vessels were well paid and carefully selected.

There is, therefore, no complete answer to our question at the present time. I hope that searches in family archives may yet reveal some essential records of the early bush doctors. Meanwhile, I would offer accounts, not specially selected, of three of them as their patients saw them. The first is by Ada Cambridge (1903):

> The manufacturer [of fine wines] combined the professions of vigneron and doctor[1]—in our time the only doctor for many miles around. He was a German gentleman who had left his country to escape some difficulty with military service . . . he might have been born where we found him so attached was he to his little town . . . he lived there for over forty years, I believe, and is buried there. . . . Cut off as he seemed to be from the intellectual world, he yet kept in touch with it; with all the work of his practice and wine-making, he found time for scientific studies, not reading only, but writing for magazines and newspapers. . . .

The second account comes from the *South Australian Register* (1867):

> No matter at what hour or in what weather his services were required he never was found wanting. A bold and fearless rider, he went long dreary journeys, over very rough country, ignoring self, so that he might relieve suffering humanity. He went as freely to the poor shepherd's hut as to the wealthy settler's snug head station. Generous to a fault, he has not provided so well for those he has left to deplore his loss as he might have done had he been more of the man of business and less the poor man's friend. . . .

The third description is from Praed (1902):

> Occasionally the bush doctor appeared—the original bush doctor. He was an unkempt person, with a black beard that straggled all over the country, and wore a suit of "store dittoes", seedy and dusty, without a waistcoat, a white shirt badly done up, a wisp of a neck cloth and a broad-brimmed felt hat with a high crown. These things—the white shirt, the high crown, and neck-cloth—were the outward and visible sign of his dignified calling. Also a small case of instruments which stuck out of his coat-pocket. You could tell, too, that he wasn't a bushman by the way he rode, his trousers rucked up, showing his white socks and by the shortness of his stirrups. He rode what the boys called a wretched old crock, which he had taken in payment of a bad debt, and our eldest further added that he was one of those duffers who sit on the back of the saddle, and give every horse they mount a sore back. Therefore, he was not popular on those stations where he made the excuse of serious illness awaiting him for borrowing a fresh nag. He got drunk whenever he got the opportunity, which was not exactly a testimonial to his medical capacity; and as, besides, he lived forty miles from everybody, nobody sent for him, unless it was a very grave emergency indeed. That was perhaps why it happened that the people he went to see were generally dead by the time he passed back again, though it did happen sometimes in the case of an accident, when the only hope of saving life seemed to lie in a possible operation, that the patient recovered. That was not thanks to the doctor; perhaps he had an instinctive understanding that the Old Dame was a healer greater than he, and so sat and looked on and did not perform the operation. Anyhow, Nurse Nature, now and then justified his faith.

. . . . .

> By his work in the hells of the shearers,
> Where the drinking is ghastly and grim,
> Where the roughest and worst of his hearers
> Have listened bareheaded to him;
> By his paths through the parched desolation,
> Hot rides, and long, terrible tramps;
> By the hunger, the thirst, the privation
> Of his work in the farthermost camps

Henry Lawson adjudged the doctor "The Christ of the Outer Out-back". Perhaps we need not concern ourselves too much with his credentials.

[1] Probably a not uncommon combination, for the development of the wine industry in Australia owes much to the medical profession.

Conclusion.

I know that this survey leaves much unsaid, many problems untouched and many questions unanswered. However, I am most grateful for the opportunity to draw attention to an aspect of Australian medical history which has not been emphasized, and also to the value of contemporary lay literature in its study.[1]

Acknowledgements.

The sections on the economic development of Australia are largely based upon A. G. L. Shaw's "The Story of Australia" and "The Economic Development of Australia", although other authorities, both recent and remote, have been referred to. For two of the references to South Australian practice I am indebted to the magnificent collection of notes on "medical Australiana" made by Professor J. B. Cleland over many years and recently generously presented to the Museum of the Medical Society of Victoria. The information concerning doctors on emigrant ships is based on many brief references in contemporary journals; these are included in the list of references to Australian medicine in British medical periodicals (to be published), recently prepared largely by Miss Anne Tovell, to whom I am also indebted for assistance in tracing appropriate illustrations and forgotten references.

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[1] The Museum of the Medical Society of Victoria is classifying and indexing the more important references to medical matters in the lay literature. Because the latter is so vast, a note concerning references which readers may encounter would be greatly appreciated.

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RECENT ADVANCES IN THE TREATMENT OF SUPERFICIAL FUNGOUS DISEASES: THE USE OF ANTIFUNGAL ANTIBIOTICS.[1]

By G. F. DONALD, D.D.M.,

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UNTIL recently, no efficient means of treating tinea infections of the skin has been available. Numerous chemicals are actively fungistatic or fungicidal *in vitro*, but few are safe to administer orally. We know that the dermatophytes grow in the superficial keratinized layers of the epidermis and its appendages, but externally applied chemicals do not penetrate adequately into the deeper infected layers of keratin. Externally applied chemicals may exert some influence on the natural course of tinea of the glabrous skin, but this is not due to specific antifungal properties, and any benefit derived from external medication is the result of chemical irritation. Any local irritation causes a more rapid proliferation of epidermal cells, and fungal mycelium may be shed with this increased "epithelial secretion".

Nail infections respond poorly to external applications, but at times clinical remission follows prolonged and intensive local therapy. In tinea capitis, it is very doubtful if the natural history of the disease is influenced by local medication. In both nail and scalp infections local treatment serves to remove infected debris, and only in this way can treatment aid clearing of the infection.

During the past decade, important advances have been made in our knowledge of antifungal antibiotics (Drouhet, 1958). Besides the antibiotics active against bacteria and actinomycetes, there are antibiotics (including tyrothricin) which are active both on bacteria and on fungi, but are too toxic for systemic use. Another interesting group of antibiotics are selectively antifungal, and these include the polyene group, which are products of *Streptomyces* and have wide antifungal spectra. The best tolerated of the polyenes and the least disappointing in clinical practice are mycostatin, trichomycin, and amphotericin B. Mycostatin has been extensively studied in many countries since it was first discovered in 1950, and has a place in the treatment of moniliasis, but I cannot understand why it is at present being widely prescribed for the treatment of tinea. In 1955, a symposium on the therapy of fungous diseases was published under the editorship of Sternberg and Newcomer. A clinical report at this symposium described the response of 93 patients suffering from various forms of dermatophytosis. The results of mycostatin therapy were very discouraging. At the end of an average treatment period of three months, almost all patients with *Trichophyton* or *Epidermophyton* infections still yielded positive cultures (Graham *et alii*, 1955). The only groups in which positive cultures were not obtained were *Microsporum* infections; this result would be expected, because *Microsporum* infections of the skin have a short natural history and usually clear rapidly even without treatment. This study gives no support for the use of mycostatin as a treatment for tinea infections, nor do I know any rational basis for this practice.

Recently reports on trichomycin have appeared from Japanese and Argentine clinics. One of these reports (Magnin and Vivot, 1957) suggests that trichomycin exerts a beneficial action on tinea infections. However, from discussion with dermatologists who have had experience with this drug, I think that it is of limited value.

With the advent of griseofulvin, a major advance has been made in the treatment of the superficial fungous infections due to the dermatophytes. In view of the evident confusion on the limitations of mycostatin, it should be stated at the outset that griseofulvin is not used for the treatment of moniliasis, tinea versicolor, chromoblastomycosis or the deep mycoses. Griseofulvin, which is derived from several species of *Penicillium*, is chemically distinct from the polyenes, and according to Grove (1952) is the methyl ether of a 1:3 diketone. During the past six months, through the kindness of Glaxo Laboratories and Imperial Chemical Industries Limited, I have had the opportunity to evaluate the response of more than 160 patients suffering from various forms of tinea. The major group treated comprised 142 patients suffering from tinea capitis, and included 81 infected with *Microsporum canis*, which is the commonest cause of ringworm of the scalp in general practice. My initial study of tinea capitis due to *M. canis* showed that those patients whose heads were not shaven were less likely to be cured. In some cases the infection clears within three weeks even though the head is neglected; however, griseofulvin is fungistatic and not fungicidal, and if local measures are not efficiently carried out, viable fungus may remain on the patient's skin for a long time and prolonged griseofulvin therapy will be necessary to prevent relapse. If the patient's head is not shaven, then the parents should be warned that no guarantee can be given as to cure,

[1] Read at a meeting of the South Australian Branch of the British Medical Association on November 26, 1959.

because the hair follicles may be reinvaded as soon as griseofulvin therapy is stopped.

Since July, 1959, my standard routine of treatment for *M. canis* infections has been to give griseofulvin orally in a dose of 1 gramme per day for one week to all patients aged over three years. Children aged under 12 months have been given 500 mg. daily and those in the one to three years age group have been given 750 mg. per day. After the end of the first week the dosage has been continued for a further three weeks at the rate of 250 mg. per day in all cases. All children have had their heads shaven weekly with a safety razor and washed twice daily with soap and water. A keratolytic ointment has been applied to the whole scalp after washing to loosen scales, and all children have worn a fitting cotton or canvas cap or bonnet, which is changed and boiled daily. The ointment used has consisted of salicylic acid (3%) in a washable ointment base, such as the *Cremor Sorbolen Aquosum* of the Australian Pharmaceutical Formulary (1955). A clean washable antibacterial ointment has been used in place of the salicylic ointment whenever a marked pustular reaction was present on the scalp before griseofulvin therapy was begun. Hill (1960) in New Zealand, and Kirk and Ajello (1959) in America, have mentioned that patients may show an increased inflammatory reaction on the scalp during the first few days of treatment, and parents should be warned of this possibility.

Up to the present 32 children have been treated with the routine described. Twenty-eight children were cured at the end of the four weeks' course of griseofulvin and have remained free from infection. The remaining four patients showed a marked reduction in the number of infected hairs, but some fluorescing stubs remained, and in all cases these contained viable fungus. These children were cured by a second course of griseofulvin, and in view of the cost of griseofulvin, I do not feel inclined to recommend a higher dose at present. It is not possible to treat patients efficiently unless one has acquired a simple source of filtered ultra-violet light, as this equipment is indispensable in the accurate diagnosis and follow-up of *M. canis* infections of the scalp.

The use of Wood's light will solve the majority of diagnostic problems in general practice, but when endothrix infections of the scalp are suspected, laboratory investigation is essential. This chronic infection of human origin is very prevalent among the part-aboriginal population in South Australia (Donald, 1959 and 1960), but it is also seen among white children. These endothrix infections do not show the greenish fluorescence under Wood's light, and in doubtful cases scales from suspected heads should be forwarded to the laboratories of the Adelaide Children's Hospital or the Institute of Medical and Veterinary Science. I would stress that it is the scale and not the hair which is important to the mycologist when endothrix tinea capitis is suspected. The invaded hairs break off at the skin surface, and will be seen most readily in the patchy dandruff-like scaling which is a characteristic feature of the disease.

Sixty-one part-aboriginal children suffering from endothrix tinea capitis have been treated with griseofulvin at the skin departments of the Queen Elizabeth Hospital and the Adelaide Children's Hospital. In all cases the standard routine of local treatment has been enforced, and all children appear to have been cured by the course of griseofulvin. In this infection a higher dose schedule has been customary, and the standard technique has been to give 1 gramme of griseofulvin daily by mouth for 25 days. In view of the uniformly excellent response of this difficult and chronic type of tinea capitis, it is probable that in all cases tinea capitis will clear if 1 gramme of griseofulvin is given daily for 25 days, provided that the routine of local treatment is efficiently performed. However, as I have already mentioned, I do not recommend this dosage of griseofulvin for the routine treatment of *M. canis* infections when the disease can be efficiently diagnosed and followed by the use of Wood's light. There is no reason why a child should not be given the higher dose when a parent prefers to pay for 100 tablets, but even this dosage may fail if local treatment is not performed efficiently.

Apart from the cost of griseofulvin therapy, the main disadvantages are the unwanted side effects. Headaches of varying severity are common, and nausea and diarrhœa may occur. No serious blood dyscrasias have been reported, but urticaria and other toxic eruptions are occasionally seen.

I have dealt mainly with scalp infections, because I believe that these are the group which can be most readily treated in general practice. In the case of long-standing skin and nail infections, the problems of diagnosis and treatment are more complicated. The clinical signs of tinea circinata, tinea cruris, tinea pedis and onychomycosis can be simulated by eczema, psoriasis and other erythematosquamous rashes, and in many cases a diagnosis of dermatophytosis can be made only after direct microscopic and cultural investigations. Not only is it important to have indisputable evidence of the presence or absence of fungi in skin and nail lesions, but there are important differences in the natural history and behaviour of the various dermatophytes. We know that microsporums of animal origin do not linger on the human epidermis, whereas the anthropophilic trichophytons produce indolent skin lesions and may live indefinitely in the keratinized layers of the human skin and its appendages. A knowledge of the rate of replacement of keratin is essential in calculating the total treatment time, because the fungistatic action of griseofulvin is necessary until the diseased keratin has been replaced by healthy keratin. Scalp infections need three to four weeks' treatment with griseofulvin. Infections of the thinner skin areas may call for one or two weeks' treatment, whereas the time required to replace the thick keratin of the soles is at least one month. It takes three to four months for finger nails to be replaced, and toe nails probably require four times as long. At present it is my routine to give patients with *Trichophyton rubrum* infection and all patients with onychomycosis 1 gramme of griseofulvin daily for at least one month; this dosage is combined with thorough local treatment, which consists of the filing, scraping and paring of all diseased nail tissue. Stronger keratolytic ointments are needed for nail tissue, and at present my patients are using dithranol (1%) and salicylic acid (15%) in *Cremor Sorbolen Aquosum*. After four weeks' treatment the maintenance dose of griseofulvin is reduced to 250 mg. per day. This dose may be inadequate; but it will be a long time before there is unanimity on this question. We do not know how long it will be necessary to continue griseofulvin therapy, or what chances there are of renewed activity or of reinfection. For all these reasons, I believe that only in relation to scalp infections is there sufficient information available to permit the efficient use of griseofulvin in general practice.

No doubt some of you are about to ask whether griseofulvin can be used as a local application. Peterkin in Edinburgh (1959) and Pardo Costello *et alii* in Havana (1959) have tried creams and lotions containing griseofulvin as external applications. They do not work, which is in accordance with clinical experience of other externally applied antifungal preparations. Whether the favourite prescription of an individual practitioner or one of the multitude of local antifungal agents manufactured by the pharmaceutical companies is applied, it will be ineffectual in curing tinea infections.

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STATISTICS OF KURU.

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THE figures presented in this paper are derived from a study of 150 sibships, in each of which there was a contemporary case of kuru in 1958. Ninety-nine of these siblings were born of kuru-free parents and 51 were born of mothers also affected. The figures are not in exact agreement with those of the R file, K file and Z file discussed previously by Bennett, Rhodes and Robson (1959) as regards the average size of families. The average sizes of sibships of the R file, K file and Z file vary between 2 and 3·37. The greater average mortality from kuru in siblings born of mothers also affected in the present figures may be noted.

Again, the present figures are not in exact agreement with those cited by Bennett, Rhodes and Robson and by Bennett, Gray and Auricht (1959), which find deaths of young persons by kuru somewhat heavily concentrated in siblings born of mothers also affected. The distributive ratio of the probands between siblings born of kuru-free parents and siblings born of mothers also affected is, if we exclude from the terms of this description cases of late onset in males, approximately invariable for age and for sex of probands.

Thus, where previous figures of the R, Z and K files published show late onset in about one-third of cases in females, and early onset in two-thirds of cases in females and nearly all cases of early onset in male subjects to be in siblings born of mothers also affected, the present figures show the patients in about one-third of each of these categories to be members of such sibships. The present population sample shows a ratio of male to female patients of about 1:4, which is a higher figure than that of 10:49 recorded for 200 cases observed by Gajdusek and Zigas (1959), and much higher than that of 9:59 in the R file, in which 177 cases were observed. The present sample is also a younger one than others described, containing over 45% of young subjects (by probands) as contrasted with 29% (by probands) and 19% by full count. It is a sample which has few cases of late onset in males, but many cases of early onset, whereas the R file, K file and Z file contain few cases in young males born of kuru-free parents.

The frequency of cases of kuru in young subjects in the 150 sibships discussed here is 95 in 595 individuals, or 16%. This figure is not much higher than that of 14% indicated by Bennett, Rhodes and Robson for the R file population sample. In discussing a possible genetical basis for kuru, these workers suggest that a semilethal K gene, recessive to a normal k allelomorph in males but dominant to k in females, may occur in the population of the area in which kuru is endemic. For an idealized population in which there were random mating and no selective differences, and when the gene K had a frequency of 37%, the genotypes KK, Kk and kk would have frequencies of 14%, 47% and 39% respectively, values not unlike those suggested for the data of the R file. In terms of the frequency of young patients with kuru in the

TABLE I.

Class of Sibship.	Mean Number in Sibship.	Mean Number of Deaths from Kuru per Sibship.
Born of kuru-free parents ..	4·01	1·2
Born of affected mothers ..	3·882	1·6075

present sample, the corresponding figures show that when the gene K had a frequency of 40%, the genotypes KK, Kk and kk had frequencies of 16%, 48% and 36% respectively; for if $KK = 0{\cdot}16$, then $K = \sqrt{0{\cdot}16} = 0{\cdot}4$, and $k = (1-K) = 0{\cdot}6$, and $K^2 + 2Kk + k^2 = 16 + 48 + 36$. The suggestion which has been made of a possible genetic basis for kuru is grounded on several considerations. In the first place, Gajdusek and Zigas found that kuru occurred only among the Fore people and among those of their neighbouring tribes that had a tradition of intermarriage with them, other neighbouring tribes being kuru-free. In the

TABLE II.

Age and Sex of Proband Subjects of Kuru.	Siblings Born of Kuru-Free Parents.	Siblings Born of Affected Mothers.
Young male	18	10
Young female	28	14
Male (late onset)	1	2
Female (late onset)	50	25
Females (elder and younger) simultaneous onset	2	—
Total	99	51

second place, the greater frequency of the disease in females than in males, and in young males than in adult males, suggested that there was a possible difference between cases of early and late onset corresponding to the distinction between a gene's being lethal (precluding possible reproduction) and its results being fatal (but permissive of prior reproduction). In the third place, the preliminary statistics of kuru appear to have been relatively lacking in young patients born of kuru-free parents compared with the present sample, and nearly lacking in young male patients born of kuru-free parents. This circumstance was favourable to a view that all young male subjects were homozygous for a recessive semilethal allele, and all their mothers heterozygous for the same allele, which was, however, dominant in their sex (and fatal, but not lethal at their age). The particular genetic basis suggested as having a possible application to kuru is one conceived to exist by analogy with a sex-influenced gene dominant in males, but recessive in females, which causes baldness. There has been a suggestion that pregnancy may temporarily retard the progres-

sion of kuru, and that rapid deterioration may occur during the puerperium, pointing perhaps to an endocrine influence on the disease. There is an endocrine influence on baldness, whereas a sex-influenced gene dominant in males, but recessive in females, which causes the index finger to be slightly shorter than is usual, is said to be found in early embryos before endocrine influence develops. In the fourth place, a hope that a hypothesis might assist in the direction of further investigation into kuru was a consideration relevant to its formulation. The frequency of young members of sibships suffering from kuru is high on the hypothesis that such patients are homozygous for a recessive semilethal gene. In terms of such an hypothesis, the deaths of the young by kuru are removing a number of K genes from the population in every generation. The standard figures for complete selection in such cases present the possibility that, beginning with a frequency of 0·5 for a recessive gene in the first generation, there will be found remaining in the population in the second, third and fourth generations, respectively, frequencies of 0·33, 0·25 and 0·2. As kuru is now affecting at least the third generation, its frequency should, by hypothesis, perhaps be lower than it is. In any event, in the present sample the frequency of young patients is 16%.

The number of deaths from kuru in sibships of this sample in which a proband was young (and in which all but two of all prior patients with kuru were young) is about the number expected on a probability P that one fifth of the population will be affected. This value of P is not quite as high as the ratio of all deaths by kuru to all deaths by all causes (204:913 in the R file). The number of deaths from kuru in siblings born of mothers also affected is insignificantly—1 S.D.—greater than the number expected on a probability that one-quarter will be affected. On the other hand, the number of deaths from kuru in siblings born of kuru-free parents is significantly less than the number expected on the probability that one-fifth will be affected.

Only one of the women in this sample suffering from kuru was pregnant, and she did not die before term. The figures for the number of pregnant women with kuru who died of the disease before term might well be included in future statistics, since no case has yet been published; but the present figure of "0" under this head may be dependent on limited observation to date, and not on the disease. Again, there is no certainty that rapidity of deterioration during the disease is a characteristic of the immediate post-child-bearing period. Rapidity is a feature in some and not in others, without reference to sex or age. I heard of one "late onset" female patient whose condition deteriorated rapidly after childbirth, and witnessed one in whom the disease did not develop at a sharply increased tempo after childbirth.

Twenty-six of the parental siblings of 150 siblings discussed here are known to have been born of mothers who died of kuru. In 14 of these 26 parental sibships there was no case of kuru. This is a fairly high ratio of clearance of kuru, considering that in their children's generation the average mortality from kuru is greater in siblings born of mothers also affected than it is in siblings born of kuru-free parents. We have not found a uniform pattern of pedigrees. Some kuru patients born of kuru-free parents had no grandparent that died of kuru, and others had a grandparent who died of kuru, and who was more often (by about 4:1) the mother's mother than the father's mother, though the rarer circumstance of both of these being dead from kuru also occurred in some instances.

Summary.

In a sample of 150 sibships of the Fore population with probands suffering from kuru disease in 1958, siblings born of kuru-free parents were considered in contrast to siblings born of mothers also affected. Probands, older male patients apart, were found to be distributed between these categories of sibships in a ratio nearly invariable for sex and age. The occurrence of kuru in young people was 16% of the 595 members born in these sibships. The numbers of deaths from kuru were less than those expected on the basis of $P = 0{\cdot}25$, except in siblings born of mothers also affected by the disease, among whom the mortality from kuru was noticeably higher than among siblings born of kuru-free parents. No uniform pattern of pedigrees was found.

Acknowledgements.

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CEREBRAL ABNORMALITY AND THE ELECTRO-ENCEPHALOGRAM IN RELATION TO PSYCHIATRY.

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PART II: INTERRELATIONS OF EMOTIONAL FACTORS WITH CEREBRAL ABNORMALITY AND ELECTROENCEPHALOGRAPHIC MANIFESTATIONS OF PSYCHOLOGICAL FUNCTIONS.

PSYCHIATRY suffers unfortunately from a dissociation of frames of reference, the social and psychopathological as distinct from the physical and biological. However, the interaction of neurological with psychopathological factors cannot be avoided in psychiatric practice. It is known that on the one hand psychogenic factors may affect cerebral disorder in psychosomatic terms, as in epilepsy, and that on the other hand cerebral disorder abnormality often produces psychopathological consequences because of changing interpersonal relationships.

Electroencephalographic tracings are manifestations of the functioning of the living brain. They give evidence of cerebral disorder as well as of various conditions of normal and abnormal psychological functions. As an expression of psychological functions electroencephalography may give information of the state of alertness, emotional maturity and Pavlovian conditioning of a mentally ill subject.

Accordingly, in discussing the relation of abnormal electroencephalographic patterns in psychiatric syndromes, the following four aspects have to be considered: (i) cerebral abnormality directly responsible for psychopathological manifestations; (ii) psychological disturbances leading to neuropathological processes in predisposed subjects; (iii) cerebral abnormality causing social maladjustment and hence psychopathological manifestations; (iv) electroencephalographic manifestations of psychological functions.

The first aspect has been considered in the first part of this paper. The other three parts will be the subject of this second part.

Psychological Disturbances Leading to Neuropathological Processes in Predisposed Subjects.

Factors Precipitating Epileptic Seizures.

There are photosensitive epileptics who, for one reason or another, themselves precipitate major seizures by means of looking into a flickering light. Such self-induced epileptic seizures may become conditioned in the Pavlovian

sense, so that minor stimuli, such as walking from the shade into the light, may eventually precipitate a seizure. In other epileptics emotional upsets may precipitate epileptic seizures on a neurophysiological level.

Self-Induced Epileptic Seizures.

Gastaut (1951), Bickford (1953) and Robertson (1954) describe children who deliberately induce epileptic seizures by flickering their fingers in front of their eyes in bright light (Davidson, 1957). These workers suggest that compulsive and guilty pleasures may be obtained by this somewhat unusual occupation. In this E.E.G. department, one child of particularly high intelligence was found habitually to induce subclinical seizures by flickering his hand before his eyes.

CASE I.—A boy, aged eight years, with an I.Q. of 165, had been observed to roll his eyes over a period of 11 months. Seven months previously it was noticed that this rolling of the eyes was associated with looking into the sun or bright light. For the past six months he had developed the habit of passing his hand before his eyes. He became upset when he heard sharp noises, but he enjoyed music. He suffered occasionally from headaches, short stabs lasting for a few seconds only, and he also had short emotional outbursts lasting for a few seconds. The administration of "Serpasil" made him "jumpy". The "rolling of the eyes' was usually followed by a period of mental excitement. There was a history of three major epileptic seizures at the age of two years, with none since. The boy's mother reported that, as a baby, he used to jerk when the family drove in a motor-car along a certain highway bordered by trees. The boy suffered from infantile eczema and, subsequently, from various signs of allergy. Several members of the family suffered from migraine.

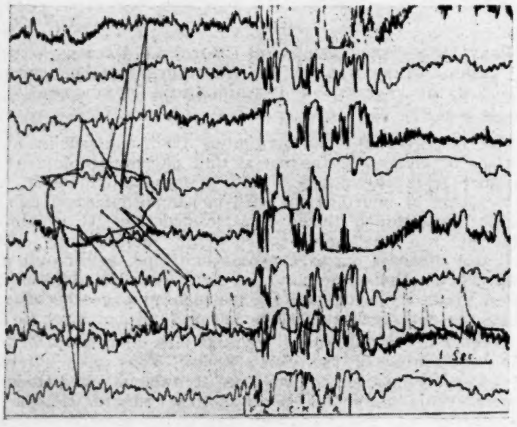

FIGURE I.
Seizure pattern produced by a flicker of light.

Photic stimulation, in the form of a flicker of a powerful light, produced poly-spike-wave seizure patterns in the electroencephalographic tracings. These electroencephalographic seizure patterns were accompanied by clinically evident jerks and jumps. After this subclinical epileptic seizure the patient was mentally excited and elated. The administration of "Tridione" reduced the intensity of these myoclonic epileptic seizures. He was sent to another school, where he joined a higher grade which provided an outlet for his considerable intelligence, and some family difficulties were adjusted. He still moves his hand under emotional stress, but this has become an automatic habit, and he rarely passes it before his eyes. This child apparently obtained relief from mental tension by this self-inflicted form of subclinical "convulsion shock therapy".

Conditioned Epilepsy.—Kreindler (1957) and Naquel and Morell (1956) report how they have conditioned epileptic animals to auditory stimuli. Gastaut (1956) refers to conditioning of epileptic seizures in man. It is thought by Shaw and Hill (1947) and by Tucker and Greenblatt (1952) that epileptics reacting to music by an epileptic seizure—the so-called "musicogenic epilepsy"—have acquired this habit by a conditioning process. No obvious and clear-cut illustration of the epileptic conditioning process was observed among epileptics in this electroencephalographic department, though there was reason to suspect that it had been missed in several cases. The boy with the self-induced subclinical seizures was later observed to produce his "fits" by one or two movements of his hand only, suggesting that some epileptic conditioning had been achieved.

Emotions Precipitating Seizures in Epileptics on a Neurophysiological Level.—It is a well known fact, though one rarely realized by the general practitioner or psychiatrist, that emotions, particularly upsetting ones, may in certain epileptics precipitate convulsive seizures. Hill (1950) mentions this fact, and Spiegel (1956) adds his own observations. Last and Lybery (1958) describe one patient in whom pleasurable excitement brought on epileptic seizures, and who had epileptogenic foci in the orbital and temporal cortex; surgical excision of the foci stopped the seizures. Livingston and Thomas (1954) think that epileptic children frequently suffer from seizures which are precipitated by emotions. Barker (1948) found that "startles" and verbal stimuli, aimed at the patient's particular conflicts and disturbing stimuli, could precipitate seizures in epileptic subjects. The electroencephalographic abnormalities produced by these activating stimuli were bursts of spike-and-wave and diffuse spike-and-wave patterns, focal abnormalities and alpha-wave blocking. An excellent demonstration of the epileptogenic effect of emotional upsets was given by one patient.

CASE II.—A girl, aged 23 years, suffered from *petit-mal* and akinetic epileptic seizures. Electroencephalographic

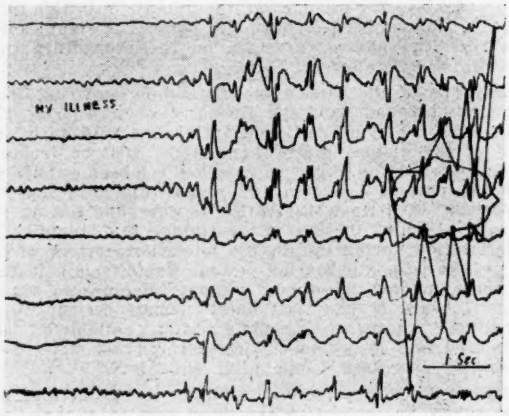

FIGURE II.
Emotional upset producing a seizure pattern.

recordings were taken during free association sessions. Whenever an "upsetting" memory was revived, referring to her relationship with her father, the electroencephalographic tracings showed consistent spike-and-wave seizure patterns. The *petit-mal* seizures occurred about five to seven seconds after the "upsetting" topic was mentioned. On one occasion an "upsetting" item also produced a clinical akinetic seizure. This psychosomatic phenomenon was consistent.

Liberson (1955) thinks that emotions can precipitate seizures in man by means of a reflex action or as a result of the formation of acetylcholine and insulin liberated during an excitatory mental state. One may also consider that a process of epileptic conditioning could account for the phenomenon, insofar as the seizure may interrupt, or consciously suppress, an upsetting emotional state. Barker (1950) found that in epileptics stress could induce paroxysmal waves which had a repressing function.

The phenomenon may also possibly be an expression of the observation (Smith, 1952; Ulett, 1957), not accepted

by all workers (Kershman, 1951), that psychoneurotics and schizophrenics tend to have a lower convulsive threshold than the average normal subject. One can then argue that psychoneurotics and schizophrenics are likely to suffer more from emotional upsets than normally adjusted subjects, and that the emotional state may explain their mild epileptic tendency or low convulsive threshold. An upsetting emotion may lower the already low convulsive threshold of an epileptic and actually trigger off a convulsive seizure.

Several workers (Chance, 1957) are inclined to consider epileptic seizures in terms of purposeful behaviour, particularly after observing that, in a certain strain of mice, major seizures occur as a normal form of behaviour when they fall from a height, thereby protecting the rigid body from injuries and concussion. According to this school, it is not surprising that emotions precipitate epileptic seizures as a form of adaptive behaviour.

Do Intellectual Occupation and Mental Imagery Have an Anti-Convulsive Effect in Some Epileptics?—Many epileptics have subclinical dysrhythmic seizure patterns in their electroencephalographic tracings. It has been a frequent observation in this electroencephalographic department, and is sometimes also casually mentioned in the literature, that electroencephalographic seizure patterns often tend to disappear, similarly to the blocking of the alpha rhythm, when the patient opens his eyes. In some cases, electric potentials reminiscent of the habitual seizure patterns in the electroencephalographic tracings were observed when the patient opened his eyes.

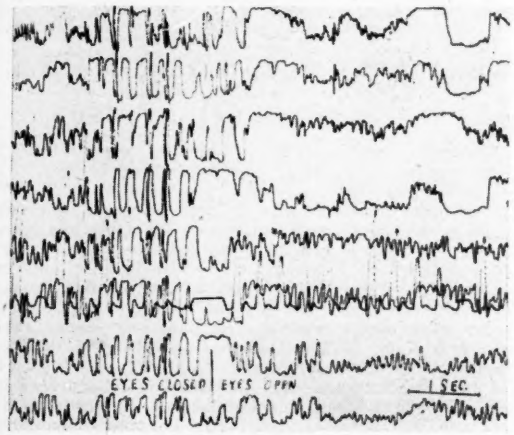

FIGURE III.
Opening of the eyes breaking up a seizure pattern.

The discoverer of the electroencephalographic brain-waves, Hans Berger, observed that normal alpha waves were broken up or "blocked" when the patient opened his eyes. This phenomenon is thought to be due to a desynchronization of the cortical electrical activity. It seems reasonable to assume that the epileptic hypersynchronous electrical potentials are desynchronized when the patient opens his eyes, in the same way as the alpha waves.

The existence of a process of desynchronization of electrical activity in the electroencephalogram has been observed not only when the subject opens his eyes, but also during intellectual effort, marked alertness (Magoun, 1952), mental imagery (Golla, 1943; Walter, 1953) and Pavlovian conditioning (Artemiev, 1952, Gastaut, 1957). Hence one is inclined to expect that intellectual effort, marked alertness, mental imagery and learning may be able to "block" subclinical seizure patterns in the electroencephalogram as well.

On a hypothetical basis, then, opening of the eyes, intellectual efforts, mental imagery, marked alertness and learning, in certain epileptics, not only may "block" subclinical seizures, but may stop clinical epileptic seizures as well. Thus, any drugs inducing alertness, mental imagery or intellectual effort may in certain epileptics have an anti-convulsant effect.

Such a drug may be caffeine. Indeed, Gibbs and Gibbs (1953) hold that caffeine can, for some myoclonic epileptics, be a most potent anti-convulsant drug. In pyknolepsy, which is a kind of "*petit-mal* status epilepticus", large amounts of amphetamine are effectively used as anti-convulsant treatment. Small amounts of amphetamine, combined with educational therapy, were tried on a number of selected epileptics whose subclinical seizure patterns in the electroencephalogram were blocked when the eyes were opened. The possible anti-convulsant effect of small amounts of amphetamine in certain epileptics, whose seizure patterns in the electroencephalogram are blocked when their eyes are open, is illustrated in one

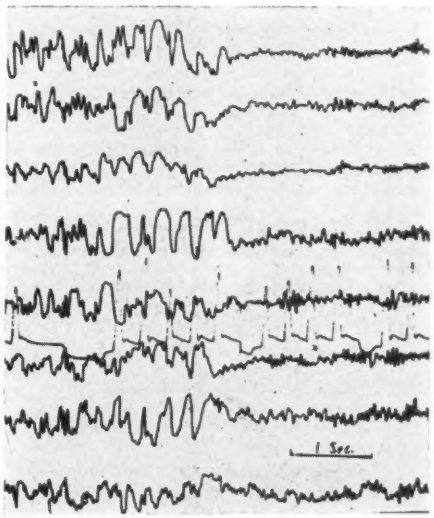

FIGURE IV.
Not on drugs.

case. Such illustrations, of course, are only suggestive of a possible anti-convulsant effect of amphetamine. They are by no means conclusive, as no control tests on non-epileptics were performed.

Cerebral Abnormality Causing Social Maladjustment and Hence Psychopathological Manifestations.

For the sake of convenience, cerebral abnormality will be divided into epilepsy and other organic pathological conditions.

Psychopathological Result of Epileptic Seizures.

Statistics.—According to Gibbs and Gibbs (1953), the incidence of psychiatric conditions in epileptics is high, even when one discounts those directly attributable to the seizures. Superimposed psychiatric conditions occur in about 50% of epileptics suffering from both major and psychomotor epilepsy; in 42% of epileptics suffering from psychomotor seizures only; in 11% of epileptics with epileptogenic foci; in 10% of epileptics suffering from *petit-mal*; in 8% of epileptics suffering from Jacksonian seizures; and in 6% of epileptics suffering from major seizures only. These psychiatric disorders, classed in order of frequency, are: personality disturbances, behaviour disorders, psychoneurosis, suicidal tendencies and depressions, paranoid tendencies, "nervousness", temper tantrums, attacks of rage, manic-depressive psychosis, confusion and memory defects.

The "Epileptic Personality."—Reference is often made to the "epileptic personality", characterized by irritability,

depression, anti-social tendencies, mental-retardation, egoeccentricity and religiosity. There does not seem to exist a specific epileptic character disorder in children, though "*petit-mal* children" tend usually to be passive, quiet, thumb-sucking, and to suffer from nightmares (Gastaut, 1951; Pond, 1952), and some epileptic children tend to be slow, some hyperkinetic and some egocentric. Investigations into the ætiology of these non-ictal psychiatric abnormalities carried out only within the last few years suggest that these inter-ictal psychiatric disturbances are the result of environmental (especially parental) factors affecting the handicapped child (Bridge, 1949; Pond, 1952; Strotzka, 1954). Epileptic children often come from broken homes, have neurotic parents and are submitted to an inconsistent discipline. The mother of

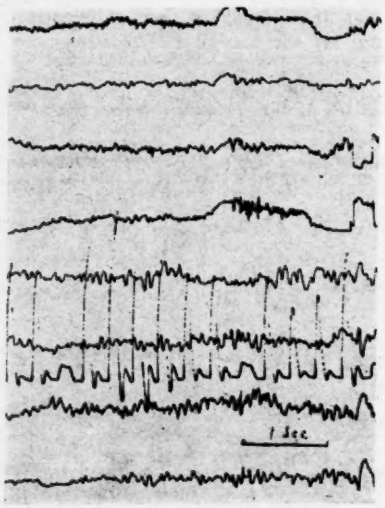

FIGURE V.
On amphetamine.

an epileptic child may show excessive over-solicitude, covering up intense hostility and guilt (Ounsted, 1955; Strotzka, 1954). The temporal-lobe epileptic child, functioning at a much lower level of emotional behaviour than the normal child, is apt to disturb family relationships profoundly (Ounsted, 1955). The "epileptic personality" is thought to be the result of a reaction-formation of a handicapped subject, struggling for a place in the community, convinced of being an abnormal member of the society, with a resentful, discouraged searching for security and religiosity to bolster up self-esteem (Noyes, 1953). Several psychological investigations of epileptics in this electroencephalographic department monotonously confirmed the above-mentioned observation made by other workers. The story of an epileptic patient is outlined.

CASE III.—An epileptic girl patient, aged 23 years, had six sessions of free association. She was severely jealous of her older non-epileptic sister who, not handicapped as was the patient herself, had had a proper high-school education, and furthermore, unlike the patient herself, had had numerous boy-friends and had recently married. There was resentment against her parents who, because of her illness, had prevented her from undertaking many adult occupations, and, as she felt, had treated her like an irresponsible child. As a result of the attitude of her family she behaved impulsively and was "naughty", which caused her family to restrain her even more. Eventually she was trained as a typist, but whenever she found a job her employers dismissed her when they found she was an epileptic. Her family was incapable of coping with her immature and impulsive personality, and eventually sent her to a psychiatric home. The problem which bothered her was that she believed that she had brought the illness on herself by her "naughtiness" and "cheek". She was convinced that it was a punishment for all the sins she had committed. and that whenever she did something wrong the subsequent *petit-mal* seizure (confirmed by the electroencephalogram) was an atonement. Her whole "superego" seemed to be embodied in her epileptic illness.

What Is the Psychological Effect of Subclinical Seizures Which Are Obvious Only in the Electroencephalogram, and How Do They Affect the Personality?—Of practical interest, especially in relation to children, is the question whether subclinical epileptic seizures, evident in the electroencephalogram as high-voltage electric potentials, have a psychological effect, even though there are no obvious clinical signs. In this electroencephalographic department it was observed that children who were subject to subclinical seizures frequently suffered from speech defects, intellectual backwardness and behaviour disorders.

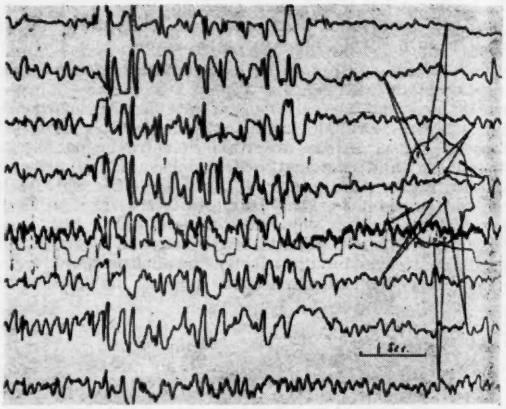

FIGURE VI.
Subclinical epileptic seizure without obvious clinical manifestations.

In relation to the classical *petit-mal* spike-and-wave seizure, it was found that only when the electrical potentials in the electroencephalogram exceeded 1·000 microvolts was there an impairment of consciousness, but that otherwise there was only a slight slowing of responses with some confusion of thinking, while perception and memory were partly retained (Penfield and Jasper, 1954; Hovey and Kooi, 1957). A good illustration of this fact is found in pyknolepsy (*petit-mal* status epilepticus in children), in which the most marked clinical features are reversible backwardness and listlessness. Epileptic mental lapses need not be associated in the electroencephalogram with wave-and-spike seizure patterns only; they are also known to occur with subclinical patterns of the major seizure type, such as poly-spike-wave seizure patterns (Penfield and Jasper, 1954). During the subclinical seizure, incoming sensory impulses may be blocked or deviated into neuronal channels which interfere with a learned response, and abnormal impulses are fired (Li, 1953) which are likely to interfere with the integrative intellectual function.

Whatever the psychological abnormalities during a subclinical seizure may be, they are likely to affect periodically the optimum efficiency of the function of the brain, resulting in an inadequately adjusted response to new environments and circumstances. Such episodes of a low level of brain function may conceivably result in apparent intellectual backwardness and speech defect. A child so affected may thus react to an episodically imperfectly-understood picture of his social reality by developing emotional disturbances (Liberson, 1955).

Psychopathological Reaction-Formation to Organic Cerebral Disorder.

A subject suffering from an organic cerebral abnormality, who is thereby handicapped in one or several of his

psychological functions, may no longer be capable of adjusting himself to the changes of modern society, with a resulting psychopathological reaction. Old people and subjects who have suffered from a head injury or other illness affecting the brain are apt to react inadequately to their surroundings, and hence to succumb to neurotic or psychotic traits in their personality.

Often the cerebral abnormality is clinically obvious and can be diagnosed with ease; sometimes, however, it is minimal, and difficult to detect by ordinary neurological methods. Electroencephalographic examinations, in conjunction with psychological tests for mental deterioration, can at times suggest some mild organic cerebral disorder which may have been previously missed, and which may have been one of the factors responsible for mental illness.

The impression was gained in this electroencephalographic department that organic abnormalities responsible for maladjustment and reactive mental illness are more often missed by the psychiatrist than is generally realized. One wonders to what extent elderly people suffering from "involutional melancholia" are really cerebral arteriosclerotics who are reacting depressively to their developing intellectual handicap.

CASE IV.—A man, aged 53 years, had been suffering from depression for some years, for which he consulted a psychiatrist. The depression was mainly characterized by a feeling of inadequacy in coping with the complexities of his business and loss of self-esteem. He was actually in financial difficulties. Psychological tests suggested a normal intelligence, but some mental deterioration. An electroencephalographic examination was performed. The electro-

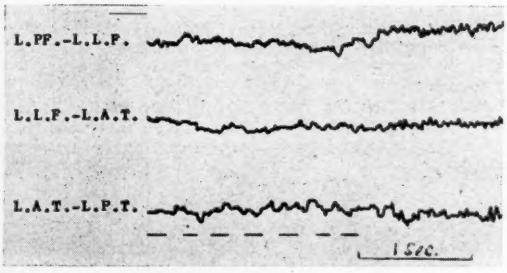

FIGURE VII.

Sample of theta waves in early arteriosclerotic dementia. L.PF.: left prefrontal; L.L.F.: left lateral frontal; L.A.T.: left anterior temporal; L.P.T.: left posterior temporal; L.O.: left occipital; R.P.F.: right prefrontal; L.M.F.: left midfrontal; R.L.F.: right lateral frontal; R.M.F.: right mid-frontal; R.F.: right frontal; R.P.: right parietal; R.O.: right occipital; L.F.: left frontal; L.P.: left parietal.

encephalographic tracings showed synchronous bursts of medium voltage slow waves, becoming more marked during hyperventilation and photic stimulation, and scattered theta waves in most cortical regions. The medical history revealed that he had had hypertensive arteriosclerosis for some years. The patient's blood pressure, taken after the electroencephalographic examination, was 240/130 mm. of mercury. On being questioned, he related that his depression had started when he found that his memory was not as good as it used to be, and he himself attributed his mental depression to his incapacity to cope with his skilled job, which required a good memory. The electroencephalographic tracings, in conjunction with his memory defect, the history of hypertensive arteriosclerosis and the result of the psychological testing suggested mental deterioration, resulting from mild early arteriosclerotic dementia, in an intelligent person.

Psychological Aspects of the Use of Electroencephalograms in Psychiatry.

Electroencephalographic tracings, being a manifestation of the function of the living brain, are also known to express a number of psychological functions, particularly in relation to emotional maturity (Hill and Parr, 1950), the thinking process, mental imagery, Pavlovian conditioning and others (Gastaut, 1957; Golla, 1943; Hill and Parr, 1950; Lindsley, 1944).

Cerebral (Emotional) Immaturity.

An excess of theta waves, scattered or in runs, of alpha voltage or less, localized in the central and temporal regions, is often found in patients with psychopathic personalities, and is thought to be a cerebral maturational defect. Statistics suggest that 25% to 45% of psychopaths generally, and 65% of aggressive psychopaths especially, have an excess of theta waves (Hill and Parr, 1950; Schwab, 1951). Moreover, Hill (1950) observed that, with increasing age, the theta activity diminished, in some correlation with the psychopath's clinical improvement.

A number of clinically immature children and a few psychopaths were examined in this electroencephalographic department. Surprisingly, it was found that in those patients not only was there an excess of theta waves, but the whole electroencephalographic pattern was in every respect dramatically similar to that found in a younger age group. We used the standard of normal electroencephalographic tracings for each age group, as illustrated by Gibbs and Gibbs (1953). In some of the psychopaths with immature electroencephalographic patterns, the I.Q. had also been tested and found to be normal.

CASE V.—A girl, aged 6 years, with an I.Q. higher than 81, was extremely destructive, solitary, restless, emotionally very immature, soiling herself, dribbling and thumb-sucking, but responded in a timid way to personal kindness. The mother was a patient in a mental hospital. There were no abnormal neurological signs. The electroencephalographic

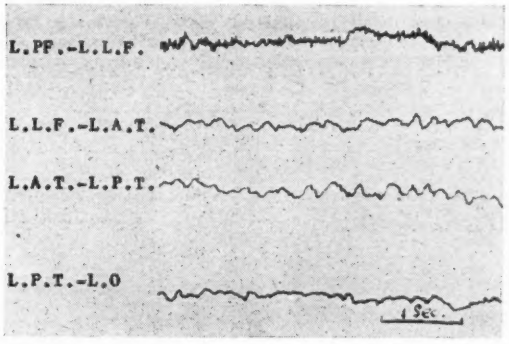

FIGURE VIII.

Sample of immature slow wave electroencephalogram pattern. Key as for Figure VII.

pattern is very immature, corresponding approximately to that of an average child aged two to three years.

Out of 1000 psychiatric patients examined in the electroencephalographic department at Mont Park, eight were found both to be clinically immature and to have drastically immature electroencephalographic patterns, not merely an excess of theta waves as described in the literature.

Electroencephalographic Testing for Deafness.

Stimulating sounds in a sleeping patient cause a short synchronous burst of high-voltage waves, the so-called "K complex" (Davis, 1939). We found the test useful in apparently deaf children, who were too young to be able to comment on acoustic sensations, or were otherwise handicapped.

CASE VI.—A restless, distractable and aphasic child, aged three years, was suspected of being deaf. Acoustic stimulation during sleep produced in the electroencephalogram the characteristic "K complex", suggesting that the boy was experiencing some sensation of sound.

Conditioned Alpha Blocking.

The ordinary alpha waves tend to disappear or be blocked in most, thought not in all, subjects when they open their eyes. A supposedly blind subject whose alpha waves are blocked when he opens his eyes is likely to have some sensation of light.

CASE VII.—A woman patient, aged 37 years, during a state of melancholia, fired a bullet through the frontal region of her head, destroying the left eye, which subsequently had

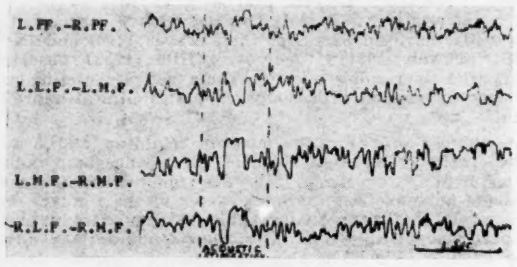

FIGURE IX.

"K" complex in a sleeping aphasic child. Key as for Figure VII.

to be enucleated, and detaching the retina in the right eye. She appeared to be completely blind. The electroencephalographic tracings showed that there was some blocking of the alpha waves when she opened her eyes in daylight as well as in complete darkness.

The only explanation for the blocking of the alpha activity in complete darkness was that the alpha-wave blocking had been conditioned in the Pavlovian sense (Jasper, 1941; Knott, 1941) to the opening movement of the eyelids. The conditioned alpha-blocking response,

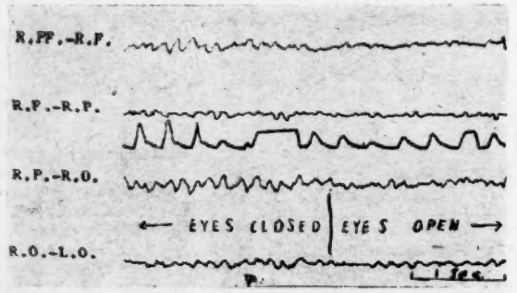

FIGURE X.

Opening of the eyes producing alpha wave blocking in complete darkness. Key as for Figure VII.

probably established when she was still able to see, seemed to have persisted after she had become blind. This phenomenon suggests that in some subjects the automatic opening of the eyelids, by means of a learning process, brings on a higher state of alertness and intellectual preparedness, which ceases when the eyelids are closed.

Excess of Theta Waves in Some Melancholics.

Several elderly patients, suffering from depressive states, underwent prefrontal surgery. Their electroencephalographic recordings were taken before the operation and at intervals after. An excess of theta waves disappeared in those patients whose mental condition improved after the operation.

This observation suggests that in some patients suffering from melancholia there is an excess of theta waves, which seems to be associated with the mental illness.

Intermittent Slow Wave Patterns in a Hebephrenic Schizophrenic.

The borderline between schizophrenia and epilepsy is sometimes badly defined. Sherwood (1958) reports that electrical tracings with implanted electrodes taken from subcortical structures in the temporal and frontal lobes of schizophrenics show paroxysmal activity in a wide variety of places. Schizophrenics often have a low convulsive threshold (Smith, 1952). On the other hand, Hill

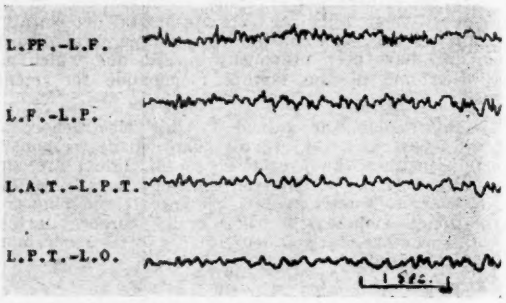

FIGURE XI.

Before leucotomy. Key as for Figure VII.

(1950) described how, in a schizophrenic patient, hallucinations were accompanied by episodes of high-voltage delta activity. One such case will be described.

CASE VIII.—A hebephrenic girl, aged 19 years, suffered on rare occasions from "turns", during which her eyes became glassy and her arms and head jerked. During the resting electroencephalographic recording there were several intermittent episodes (when she said she was thinking) of low-voltage, slow (mainly theta) wave activity in all regions.

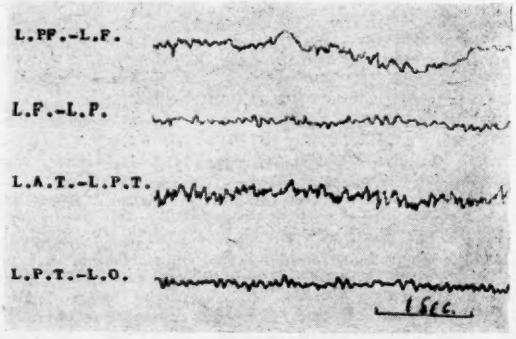

FIGURE XII.

After leucotomy. Key as for Figure VII.

During light sleep, the electroencephalographic tracings resembled closely those of the episodic slow-wave activity during the waking state. The "Megimide"-induced electroencephalographic seizure patterns, suggesting a low convulsive threshold, were of the centrencephalic type.

It is possible to interpret the low-voltage, slow-wave episodes in the electroencephalographic recording in terms of temporal lobe seizures as well as in terms of light sleep. The interpretation may be ambiguous, but suggests that a common pathology may underlie schizophrenia and temporal lobe abnormalities in certain subjects (Karagully, 1955; Rodin, 1957).

Summary.

1. Emotions may precipitate seizures in a number of epileptics. Pavlovian conditioning of epileptic seizures is discussed, as well as the relationship between emotional upsets and *petit mal.*

2. Cerebral abnormality may result in psychological handicaps leading to social maladjustment, and hence to mental disorders. This has particular relevance to the personality disorders of epileptics and patients with organic cerebral defects.

3. An hypothesis is formulated that intellectual alertness and mental imagery, stimulated by amphetamine, may be the basis of its anti-convulsant effect in some epileptics.

4. Subclinical seizures, noticeable only in the electroencephalogram, may produce episodes of poorly integrated mental functioning, with apparent backwardness, speech defect and behaviour disorders in children.

5. With respect to psychological functioning and the electroencephalogram, the following observations were made: (i) Several emotionally immature patients had also immature encephalographic patterns, which corresponded to those of an early age group, thus supporting the clinical diagnosis. (ii) The electroencephalogram was found useful in testing small children for deafness. (iii) The demonstration that alpha blocking is conditioned to eyelid movement may possibly have some relevance to "learning theory". (iv) Some melancholics had an excess of theta waves, which disappeared after a clinically successful prefrontal leucotomy. (v) A borderline case, between hebephrenic schizophrenia and epilepsy in terms of the electroencephalogram, is demonstrated and discussed.

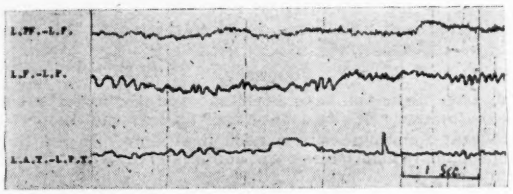

FIGURE XIII.

Intermittent theta activity replacing normal alpha activity in a hebephrenic schizophrenic patient. Key as for Figure VII.

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THE USE OF HALOTHANE FOR NEONATAL ANÆSTHESIA.

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IN 1946, Dr. M. McClelland introduced to the Royal Children's Hospital, Melbourne, the method of anæsthetizing neonates which with minor variations has been used extensively since that time. Basically, the method consists of anæsthetizing the baby with cyclopropane until anæsthesia is deep enough for endotracheal intubation. After intubation, the anæsthetist administers the anæsthetic by intermittent compression of the rebreathing bag (controlled respiration). Adequate depth of anæsthesia and degree of relaxation are achieved by adjusting the concentration of cyclopropane given.

This procedure has been eminently satisfactory. However, cyclopropane is inflammable, and for that reason the present investigation was undertaken to find whether the non-inflammable agent halothane could be substituted for cyclopropane. (It may be mentioned, in passing, that to a non-surgical observer it would seem that while the use of diathermy facilitates neurosurgical operations in neonates, it does not appear to help much in abdominal or thoracic surgery. In such cases, even when a non-inflammable anæsthetic is administered and the diathermy is set up ready for use, it may be used only twice or three times during the whole operation.)

The method used is as follows. Premedication with 0·2 mg. of atropine is given. Anæsthesia is induced with halothane, vaporized with oxygen flowed at 2 litres per minute and administered with an infant-size face mask. A concentration of 2·5% to 2·8% is required, and this must be given for about ten minutes to produce sufficient depth of anæsthesia to permit intubation. It is to be noted that halothane, when administered with oxygen, is slower to act than cyclopropane with oxygen. After intubation, nitrous oxide is added in the proportion of 2 litres of nitrous oxide to 1 litre of oxygen. For thoracic and abdominal surgery, respiratory control is gained by rhythmical compression of the rebreathing bag. The anæsthetist continually reduces the concentration of halothane with the aim of administering only sufficient to gain the required depth of anæsthesia. A concentration of 0·5% is usually adequate at the end of the operation. About five minutes before the end of the operation, halothane is discontinued and the return of spontaneous respiration is encouraged. Pure oxygen is given for about two minutes before the endotracheal tube is removed. A carbon-dioxide absorber is usually used, though there can be little opportunity for carbon dioxide to accumulate when the gases are flowed at 3 litres per minute.

In the present series there were two neurosurgical cases. In each of these spontaneous respiration was continued after intubation, and the nitrous oxide-halothane mixture was administered by an Ayre's "T" piece technique.

Babies with the following conditions have been anæsthetized in this way: diaphragmatic hernia, one patient; tracheo-œsophageal fistula, three patients; exomphalos, two patients; meconium ileus, one patient; burst abdomen (earlier operation for intestinal obstruction), one patient; intestinal obstruction, three patients; duodenal stenosis, one patient; hydrocephalus, one patient; meningomyelocele, one patient.

The two neurosurgical patients each weighed about 8 lb., but the others, as is usual in such cases, were mostly premature and below average in weight.

The anæsthetic administrations were satisfactory and without incident, except for one case of tracheo-œsophageal fistula, in which retraction of the heart caused temporary circulatory embarrassment. After removal of the retractor, the heart action immediately returned to normal. This complication was considered to be unrelated to the anæsthetic administration.

Summary.

Fourteen neonates have been successfully anæsthetized with halothane. It was observed during the induction phase that halothane was a good deal slower to act than cyclopropane when both were administered with oxygen.

Acknowledgement.

I wish to acknowledge the help of Dr. M. McClelland, Director of Anæsthesia, Royal Children's Hospital, Melbourne, who was kind enough to inspect this paper for me.

Reviews.

Recent Progress in Microbiology. Edited by G. Tunevall; 1959. Oxford: Blackwell Scientific Publications. 9¾" × 6", pp. 453, with illustrations. Price: 70s. (English).

THE Seventh International Congress for Microbiology was held in Stockholm in August, 1958. In addition to the specialist papers delivered to the numerous subsections of the congress, there were six symposia on subjects of topical interest to microbiologists, at which papers were delivered by selected speakers. The present volume consists of the major papers and several of the minor contributions to each of the symposia. The proceedings of some of the meetings are enlivened by well edited reporting of the discussions which followed the major papers.

The subjects dealt with were the following: "Recombination Mechanisms in Bacteria", "Role of Protein in Nucleic Acid Synthesis and Role of Nucleic Acid in Protein Synthesis", "Tissue Specific Antibodies", "Latent and Masked Virus Infections", "Germ-Free Animals", "Continuous Culture Methods and Their Application".

The symposium on "Recombination Mechanisms in Bacteria" contains an outstanding contribution by Jacob and Wollman, of the Pasteur Institute, as well as sound papers by Stocker, Cavalli-Sforza, and Ephrussi-Taylor. In the second symposium, the present state of nucleic acid biochemistry is ably summarized by Spiegelmann, Gale, Ochoa and Zamenhof.

The discussion on "Tissue-Specific Antibodies" lacks the clarity of the first two, perhaps because in this active field there is still a mass of rather bewildering detail with, as yet, no unifying concepts of mechanism. Perhaps Burnet's clonal selection theory of acquired immunity may provide this.

The symposium on "Latent and Masked Virus Infections" suffers from the fact that a considerably more detailed treatment of the same topic had been undertaken less than a year earlier at Wisconsin. Nevertheless, the full discussion which followed the present symposium, and which is fully reported, should help to codify and clarify the use of terms which have been very loosely used in the past.

The last two symposia were to a large extent concerned with methodology. It is only in the last few years that

Reynier's pioneering work on germ-free animals, initiated in 1928, has been exploited elsewhere. The proper utilization of germ-free animals, which may throw light on topics as diverse as dental caries, latent viruses, and antibody production, lies in the future. The last symposium, also, was largely concerned with technology, but once again, the theoretical and practical possibilities which lie ahead of the proper exploitation of continuous culture methods make the reports of considerable interest and importance.

The volume as a whole is beautifully produced, and it contains articles by experts in many different branches of microbiology. The specialist will perhaps find his own particular subject better dealt with elsewhere, but he will certainly profit by reading the articles in marginal fields, and the general reader, interested in modern microbiology, will find in this volume a collection of lucid essays on many of the growing edges of the subject.

Hernia. By Sir Heneage Ogilvie, K.B.E., M.A., M.Ch., M.D., F.R.C.S.; 1959. London: Edward Arnold (Publishers) Limited. 8½" x 5½", pp. 144, with 51 illustrations. Price: 28s. (English).

IT would be to the advantage of all surgeons, young and old, to read this recent book by Sir Heneage Ogilvie. It contains a simple exposition on many fundamental requirements of operative surgery—for example, the principles of the use of various suture materials, of the use of local anæsthesia and of the making of skin incisions. All would benefit from reading these pages, whether they perform operations for hernia or not. Practical consideration is given to the use of trusses.

In simple language, and with the aid of clear diagrams, advisable operations are described. These are uncomplicated and restore the normal anatomy as much as is possible. While many opinions are given dogmatically, this is not so marked a feature as the author threatened in his introduction. Moreover, the methods of others are described clearly and without bias. While most space is given to inguinal herniæ, most other types which may be encountered are described. Methods suggested for their repair are always the simplest and most logical.

When the author moves into the realm of comparative anatomy and evolution, his views may be open to criticism. This aspect is, of course, of no practical importance; but it is regrettable that he still makes the old mistake of describing the testicles creeping down the posterior abdominal wall of the embryo.

This book should be on the shelves of highly trained surgeons, as well as of those for whom repair of a hernia is the summit of achievement.

A Manual of Bandaging, Strapping and Splinting. By Augustus Thorndike, M.D., F.A.C.S.; third edition; 1959. Philadelphia: Lea & Febiger. Sydney: Angus & Robertson, Limited. 7¼" x 5", pp. 156, with 125 illustrations. Price 30s. 3d.

THIS book will be invaluable to anyone required to administer first aid, as well as to the medical student, who, at the University of Sydney, is never introduced to the bandage at all. There is the barest minimum of text, the work consisting mainly of over one hundred full-page illustrations, most of them excellent.

The scope is truly bandaging in its widest sense. Both rolled bandage and "Tubegauz" (here called "Surgitube") techniques are given, although the author doubts if the use of the tubular bandage will ever replace the older method. Septic wound dressing is discussed, with illustrations of drains, poultices and hydrocollator packs, etc., as well as useful devices such as the scultetus and Montgomery straps. Excellent strappings are given for sprains, contusions and dislocations, and drawings of standard splints for the emergency treatment of fractures. Sections on the transport of fracture patients and the use of plaster of Paris complete the monograph. Newer types of rigid bandage are described, such as "Vinalite" and "Lucite", thermoplastic substances exhibiting the phenomenon of hysteresis.

It is stressed that this is not a textbook of treatment of any of these injuries; indeed, the author frequently alludes to suitable works and gives a long bibliography at the end.

One hopes that the reader will remember that a plaster cast for Colles's fracture should not extend beyond the distal palmar crease, in contrast to the one shown here; but since this illustrated splint is intended evidently as a temporary measure, this is a minor criticism. The author tends to the view that in the acute stage of many fractures, owing to the danger of swelling, the application of slabs or three-quarter encirclement of the limb is preferable to complete cylindrical casts, the latter method being used when the acute stage has passed.

Convulsive Disorders of Children. By Dora Hsi-Chih Chao, M.D., Ralph Druckman, M.D., and Peter Kellaway, A.M., Ph.D.; 1958. Philadelphia and London: W. B. Saunders Company. Sydney: W. Ramsay (Surgical) Limited. 9¾" x 6", pp. 151, with 25 figures. Price: 60s.

THIS book is based on experience gained since 1949 in the investigation and management of convulsive disorders at the Blue Bird Circle Children's Clinic, Methodist Hospital, Houston, Texas. It is almost entirely clinical in presentation, and one is spared the usual array of statistics. Case reports are concise and well selected.

Convulsive disorders are classified as idiopathic epilepsy, symptomatic epilepsy, and associated conditions in which convulsions are provoked by extracerebral disturbances. The authors have rejected *petit mal* and other established terms in favour of more specific descriptive titles—viz., lapse attacks, myoclonic jerks, akinetic attacks and massive spasms—which correlate more readily with electroencephalographic patterns.

Thorough clinical and laboratory investigation is urged, to enable more cases to be excluded as extracerebral, or labelled as symptomatic, and to ascertain whether a progressive or treatable condition is present. Considerable pains are taken to determine whether convulsions are focal in origin, although surgical treatment of atrophic foci is considered only after medical control has failed.

Electroencephalography is recommended for diagnosis and prognosis and as a guide in treatment. The technique used is outlined, and characteristic diagnostic patterns are described and illustrated. It is emphasized that electroencephalograms have limitations, and that readings must be critically considered in conjunction with clinical findings. The authors do not appear to have had the usual technical difficulties in obtaining adequate electroencephalograms in young epileptic children, many of whom are also mentally retarded; nor is there mention of difficulties of interpretation in electroencephalograms of children. However, no exaggerated claims are made for this harmless means of investigation.

Drug therapy is presented systematically and concisely, so that quick reference can be made. Treatment is similar to that in use in this country, but the results obtained with "Diamox" seem more favourable than ours.

There is an excellent table of drugs currently in use (in the U.S.A.), giving indications for use, dosage at different ages, common toxic effects, etc. The index is equally good.

The book is spaciously presented and clearly set out. A considerable British influence is evident from the selected references and the introduction.

Survey of Clinical Pediatrics. By Lawrence B. Slobody, M.D.; third edition; 1959. New York, Toronto and London: McGraw-Hill Book Company, Incorporated. 9" x 5¾", pp. 566, with 32 tables. Price: $11.00.

A STUDY of the third edition of this book shows that a thorough rewriting has removed almost all the shortcomings of its predecessor. In particular there will be found an evenness of quality and a uniformity of presentation which allow it to be recommended to those whose work is not primarily or solely in the pædiatric field, as a book for quick reference and revision.

Inevitably, the compression that must accompany any attempt at summarized presentation will cause those with a special interest in some particular aspect of pædiatrics to feel that the treatment of this or that subject is too brief or superficial, and this tendency might well be expected in some of the less systematized fields, such as "Growth and Development", or "Psychological and Social Problems". Yet in the first of these the author has marshalled clearly and succinctly the essential information that an individual practitioner would be likely to require in his work among the children in his practice, while the presentation of the second is a genuinely helpful survey of a difficult field in which, as the author points out, the family doctor, who is often the first to be consulted, must decide whether he can treat the child adequately and adjust the environment by guiding the parents, or whether the problem is serious enough to warrant its handling by a specialist.

The clinical sections are, on the whole, excellent summaries, and all conditions commonly met with and a large number of interesting rarities have received mention which, though sometimes brief, is almost always helpful. This is

well exemplified in the section on congenital and acquired heart disease, which achieves a well-balanced and lucid review of current opinion and practice in a field where recent advances in diagnosis and treatment have added greatly to the problems and perplexities of the isolated practitioner. The sections on respiratory diseases, blood diseases and allergy, to mention but a few, also show evidence of careful and recent revision. Throughout the book there are numerous tabulated aids to diagnosis and treatment which are clear and up to date. The index, so essential for quick reference in a book of this kind, seems entirely adequate for its purpose.

Altogether we may say that the revised "Slobody" will be a useful addition to the general practitioner's bookshelf, and one that will probably be referred to with increasing frequency as the efficacy of its ready advice is proved in practice.

Case Histories in Hypnotherapy. By Arnold Furst and Lester T. Kashiwa, M.D.; 1959. California: The Genii Publishing Company. Sydney: Angus & Robertson, Limited. 5¼" × 8¼", pp. 163. Price: 65s.

THIS little book is written by a stage hypnotist, and he quotes extensively from the experience of a medical friend who uses hypnosis in his general practice. It must be assumed that the book is intended for the lay reader rather than the medical practitioner.

There is a description of various techniques for inducing hypnosis; then follows an account of diverse conditions successfully treated by hypnosis.

There are several statements which are in fact not true. On page 17 we read: "Before you can hypnotize an individual he must know you are a hypnotist; that you are trying to hypnotize him." Again, on page 53: "Before you can hypnotize a child it is necessary for him to know that you are a hypnotist and have the ability to hypnotize others".

It would seem that many of the treatments were a matter of just a few moments, and that the patient was often not seen a second time and it is just assumed that treatment was successful. There are back-stage cures, and on page 65 we read that "the entire session lasted less than two minutes".

The approach is naïve in the extreme; but its very simplicity has quite an engaging quality. The author admits some failures and some only partial successes, which is an advance over many books of this nature. The style is simple and direct, which makes for easy reading, and the book is particularly well set out and well bound.

However, we should bear in mind that it is now just seventy years since Bernheim's "Suggestive Therapeutics" was first translated into English. Since then a great deal has been learnt about the theoretical basis and the practical application of hypnosis in medicine, but clearly none of this newer knowledge has come to the authors of this little book. They are fully half a century behind the times.

"Case Histories in Hypnotherapy" may make entertaining reading for the layman, but it will be of little value to the medical practitioner.

Children in Practice. By J. Peterson; 1959. London: Cambridge University Press. 8¼" × 5¼", pp. 234. Price: 25s. (English).

DURING the past decade, a significant number of teachers of pædiatrics in medical schools and their associated hospitals in many parts of the world have become increasingly aware of the need to give their students some idea of the social and emotional factors in the lives of children, both outside and inside hospitals. How to teach this important aspect of child health is being subjected to much experimentation, especially in the U.S.A.

This book by John Peterson is designed to present the environmental background of the average English child to medical students, and it is presumably especially for those taught by the author. The specificity of its purpose is both its strength and weakness. It is about English conditions and so must be valuable for English students; for these reasons it is less valuable for other students.

The author has built his material around a central chapter on the physician and the child. The preceding chapters deal with environmental factors, physical, social and emotional, in the lives of children, and with the agencies and services which cater for the needs of the average child. There are references to some aspects of child development; but a good deal of space is devoted to the folkways and *mores* of the average English community. The chapters which follow the central one are devoted to the child in a number of settings—e.g., the home and the school—and to the handicapped child.

The descriptions of the impact of the physical environment—overcrowding, lack of playing space—are applicable in a wide range of places with a "Western" type of culture, and, of course, the emotional factors are even more widely applicable. However, the social factors, and especially the agencies and services, even the school system, have a limited range of reference, and few of these discriptions are applicable to Australia.

The author seems to have a number of special interests, elaboration of which is rather out of place in a book of this nature; for example, it is doubtful if detailed descriptions of the Froebel and Montessori systems of education are justifiable.

As far as its role as a teaching aid is concerned, one would hope that the student is merely required to use this as a reference book to find relevant material to help him make a diagnosis, and plan the management of the environmental, social and emotional factors involved in the ætiology of the diseases and conditions in children whom he studies in his hospital work. To use this as a "textbook" of social pædiatrics without immediate reference to live, human problems and situations would greatly reduce its value.

As has been indicated above, the great differences between England and Australia in social background and services and the ways in which the latter are provided reduce the usefulness of this book for teaching purposes in Australia.

Ophthalmic Nursing. By J. B. Foster, M.A. (Cantab.), B.S., D.O. (Melb.), D.O.M.S. (Lond.), F.R.C.S., F.R.A.C.S.; 1959. Sydney: Angus & Robertson, Limited. 8¼" × 5¼", pp. 144, with 40 illustrations. Price: 25s.

MANY years have elapsed since a textbook on ophthalmic nursing has appeared. It is gratifying that the most up to date book available comes from the pen of an Australian ophthalmologist.

This first edition of John Foster's "Ophthalmic Nursing" will prove popular with the nursing profession, and with ophthalmologists who have to prepare ophthalmic nursing lectures for trainee nurses. The book, although comprising only nine chapters, contains a vast amount of information expressed with clarity and precision. It will form a firm foundation upon which the trained nurse can build further ophthalmic knowledge.

The standard of all chapters is uniformly good; that of the chapters on nursing a surgical patient, on theatre nursing, on eye procedures and on out-patient trays is especially high.

The author and publishers are to be congratulated on producing a text book on ophthalmic nursing at a price which is within the reach of all trainee nurses.

Principles and Practice of Obstetric Anæsthesia. By J. Selwyn Crawford, M.B., Ch.B., D.A. (Eng.), F.F.A., R.C.S.; 1959. Oxford Blackwell Scientific Publications, Limited 8¾" × 5½", pp. 136, with illustrations. Price: 20s. (English).

IN large textbooks of anæsthesia, it has become customary to dispose of the subject of anæsthesia in obstetrics in one of the terminal chapters; usually, in a brief and sketchy manner. This unique volume breaks new ground, in that it is devoted entirely to this particular anæsthetic topic; indeed, the author claims that it is the only existing book in British medical literature devoted entirely to this matter. It deals in a concise and comprehensive manner with the whole subject. It opens with a recapitulation of the variations in anatomy and physiology which occur during pregnancy and labour and a description of the mechanics of labour. The placenta and its function are described in detail, with particular reference to the transmission of anæsthetic drugs and gases.

In the succeeding chapters, the whole gamut of obstetric anæsthesia is traversed, from the psychological preparation of the patient onwards. All the well-known agents for securing analgesia and rest in the early stages of labour are dealt with seriatim, special mention being made of the recent introduction of chlorpromazine, promethazine and the various forms of "cocktail" for this purpose. Morphine and pethidine and the use of their antagonists nallorphine and lævallorphan are dealt with in detail. The chapter devoted to "Forceps Delivery and Cæsarian Section" is somewhat rambling and inadequate, and could be confusing to the reader. This portion of the book is by way of being a critical survey of all the well-known methods of regional and general anæsthesia. The author has obviously had wide

experience of the subject, and expounds his views dogmatically. A wide knowledge of modern anæsthetic methods and technique on the part of the reader is presumed.

The well-known hazard of vomiting during obstetric anæsthesia is very properly stressed; but the recommendations for managing a patient for anæsthesia who has a full stomach—for example gastric lavage with a large stomach tube or the administration of apomorphine—will not appeal to many experienced anæsthetists. A discussion of anæsthetic problems associated with various obstetric complications and preexisting maternal disease follows, and the book concludes with an excellent appraisal of the modern approach to the subject of infant resuscitation.

This book is easy to read and well set up in clear type, and an extensive bibliography is appended to each chapter. It suffers somewhat from an almost complete absence of illustrations, photographs or diagrams. It is a useful contribution to British medical literature, and should be read by all anæsthetists and obstetricians.

Implantation of Ova: Memoirs of the Society for Endocrinology, Number 6. Edited by P. Eckstein; 1959. Cambridge: Cambridge University Press. 9¾" × 7", pp. 104, with illustrations. Price: 30s. (English).

THE conference of the Society for Endocrinology at the Ciba Foundation was concerned with implantation of ova in the wide sense, as an expression of a complex reciprocal relationship between blastocysts and sensitized endometrium. While there is surely much about the physiology and chemistry of this process that is as yet unknown, it is a measure of the attractive and significant progress of recent work in the field that it is reported that implantation of blastocysts can be delayed while they are held in utero, in a condition of suspended life without development; that localized decidual cell reactions can be produced in the endometrium without an embryo; that free blastocysts under the conditions of delayed implantation can be induced to implant by a precise hormonal stimulus; and even that the site of this implantation can be elected by local preparation of the uterine wall.

The ten informative papers published here include an account of histochemical evidence for transfer of glycogen from human endometrial glands to placental villi by J. D. Boyd, biochemical data on blastocysts and endometrium and on transfer of substances into blastocysts in utero by Cecilia Lutwak-Mann, and an account by J. M. Robson of inhibitors of pregnancy. G. Mayer describes his very instructive experiments on the control of implantation, and M. C. Shelesnyak develops a theory of histamine participation in implantation.

The book includes some references to the literature at the end of each paper and discussions. It can be recommended to teaching biologists and investigators in the field.

Childbirth Without Pain. By Dr. Pierre Vellay and others; 1959. Translated from the French by Denise Lloyd. London: Hutchinson of London with George Allen & Unwin, Limited. 5¼" × 9", pp. 216, with illustrations. Price: 35s. (English).

PIERRE VELLAY is the chief exponent of the Lamaze system of psycho-prophylaxis in pregnancy and labour, and this book describes the methods adopted in the clinics under his charge. The book is divided into three parts: first, the background to the method; secondly, the lectures given to patients; thirdly, personal accounts of the method by successful patients, and by some whose measure of success was not so complete.

In a general survey, psycho-prophylaxis is defined as verbal analgesia based on the training of the pregnant woman. Its basis is the use of conditioned reflexes, as studied by Pavlov and his pupils, and applied to obstetrics. It attempts to create during pregnancy complete chains of these conditioned reflexes which will be applicable at confinement. The strongly positive cooperation of the woman is contrasted with the passive role through dilatation as taught by Grantley Dick Read, whose work is acknowledged as a valuable contribution to obstetrics.

The eight lectures of the second part cover instruction to husbands as well as to patients, the story of fertilization and development, and a study of the principles of the method of respiration and neuro-muscular activity, and finally of delivery itself. The accent is on training in purposeful movement and the use of valuable conditioned reflexes to ensure coordinated and painless effort in expelling the baby.

The personal accounts are regarded as the most important and interesting section of the work, and are certainly remarkable for their enthusiastic support of the method. They cover primiparous and multiparous labours, and include patients who had experienced difficulty on previous occasions. There were failures; but, apart from those due to obetetrical or medical causes, these were regarded as a challenge. Their systematic study was a help in learning more of the method, and so in the end, in cutting down their numbers.

Reading the reports, we are struck by the repeated references to the comforting presence of the assistant who collaborated in the training, with constant direction of breathing exercises and muscle control.

The author states that "no one can deny that childbirth without pain has taken place", and hopes that his book will make each woman reader an enthusiastic supporter of the method. It would appear that full cooperation of practitioner, physiotherapist and nursing staff is an essential ingredient for its success, and a study of the method may well be rewarded by results comparable with those of Dr. Vellay—a fascinating prospect.

The Living Body: A Text in Human Physiology. By Charles Herbert Best, C.B.E., M.A., M.D., D.Sc. (Lond.), F.R.S., F.R.C.P. (Canada), and Norman Burke Taylor, V.D., M.D., F.R.S. (Canada), F.R.C.S. (Edin.), F.R.C.P. (Canada), M.R.C.S. (Eng.), L.R.C.P. (Lond.); fourth edition; 1959. London: Chapman and Hall, Limited. 9¼" × 6", pp. 768, with many illustrations. Price: 45s. (English).

THE first edition of this book appeared in 1938, and quickly established itself as a leading text for junior courses in human physiology. The fact that it has now reached a fourth edition is an indication of its continuing popularity. The preface to this new edition rightly points out that only well-established material that has passed from the field of controversy should be included in a text for the junior student. With this reservation, the claim is made that the book has been brought thoroughly up to date. However, a comparison with the third edition (1952) reveals that only a relatively small number of changes have been made, scattered here and there through the text. As a whole the text remains virtually unchanged. One or two of the chapters, notably those dealing with the nervous system, should have been much more thoroughly revised. To give a rather more up-to-date account is certainly possible without at the same time becoming involved in controversial material. The slightly larger page size has enabled the number of text pages to be reduced from 747 to 680. A 23 page pronouncing glossary has been added, and this also contains information not included in the main text. A 13 page appendix is new, and includes tables of weights and measures, food composition, standard weights according to height and age etc. Many of the figures in the previous edition have been redrawn, and line drawings have replaced most of the photographs of earlier editions. Unfortunately many of the drawings have a distinctly second-hand look about them, as though the artist (unacknowledged) had not had much first-hand acquaintance with biological material. The portrait drawings, in particular, are artistically poor. Despite these criticisms, "The Living Body" is still one of the best textbooks available for courses in human physiology such as would be given to physiotherapy students.

Diseases of the Nose, Throat and Ear: A Handbook for Students and Practitioners. By I. Simson Hall, M.B., Ch.B., F.R.C.P.E., F.R.C.S.E.; seventh edition; 1959. Edinburgh and London: E. & S. Livingstone, Limited. 7¼" × 4½", pp. 480, with 85 illustrations and 8 coloured plates. Price: 21s.

IT is not without good reason that, in 22 years, Simson Hall's "Diseases of the Nose, Throat and Ear" has appeared in seven editions. Students and practitioners for whom this handbook is intended are first given an outline of the necessary equipment and methods of examination. Sections are devoted to "The Nose", "Nasal Accessory Sinuses", "The Pharynx", "The Ears" and "Endoscopy". Each section is prefaced with a practical outline of the essentials of anatomy and physiology, and diagrams of the modes of examination are appropriately provided. There are seven excellent colour plates illustrating the commoner clinical appearances.

The author manages very well to describe many of the routine operations in a simple way. Unfortunately, however, the descriptions of some badly-conceived operations might well have been revised. An example is the procedure described under "Cure of Septal Deformity", in which removal of bone and cartilage is mentioned, rather than the often more desirable procedure of swinging

deflected segments into the mid-line with the preservation of the supporting framework. In the section dealing with the tonsils, the guillotine operation seems unnecessarily included, and regrettably so when the procedure is described as being completed by dissection with the finger, rather than by the reversing process of Phybus. The operation of tonsil dissection is clearly illustrated; but it is a pity that the tendency to badly-performed adenoid operations is not overcome in this widely-used textbook by a more complete description of that procedure, and with adequate illustrative diagrams.

The section on the larynx is good, and includes a short but practical description of the operation of tracheotomy and its after-care. In the description of malignant tumours of the larynx, revision might well have followed the modern conception of the term "intrinsic" as clinically applicable only to tumours confined to the vocal cord, and "extrinsic" as covering all growths extending beyond the vocal cord. The terms are misleading in clinical application, if used only in the older sense of within and without the laryngeal cavity.

The short section on treatment of extrinsic carcinoma of the larynx needs revision in the light of modern practice. To suggest that the rate of cure remains the same for pure surgery as for irradiation plus surgery is to overlook the disastrous consequences sometimes seen when operation is undertaken after irradiation and healing refuses to take place, so that open pharyngostomies and endless torment are frequently the result. The section on endoscopy is well presented, and includes a useful outline of the diseases and disorders in the larynx, lungs and œsophagus in which these procedures may be needed.

The quite extensive section on the ears, covering inflammatory diseases, treatment and the complications which may arise, is splendidly presented. Likewise too, the problems of deafness and its alleviation by surgical and other means is covered in simple yet complete fashion. At the end of the book there is a useful description of preoperative preparation of the patient, and finally a short list of useful pharmaceutical formulæ is given.

This is a very well-written little book. The author excels at clear description in compact form. Some further revision of details is desirable; but that detracts in no way from the purpose of this work, which is to explain to students and practitioners the basic process of disease in the ears, nose and throat.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Treatment of Bronchial Neoplasms", by R. R. Shaw, M.D., and D. L. Paulson, M.D.; 1959. Oxford: Blackwell Scientific Publications Ltd. Springfield: Charles C. Thomas. 10" × 6½", pp. 150, with illustrations. Price: 64s. (English).

"Essentials of Healthier Living: A Realistic College Text in Personal and Community Health", by J. J. Schifferes, Ph.D.; 1960. London: John Wiley & Sons, Inc. 9¾" × 7", pp. 350, with many illustrations. Price: $5.50.

"Modern Nursing: Theory and Practice", by Winifred Hector; 1960. London: William Heinemann, Medical Books, Ltd. 9½" × 5½", pp. 524, with 145 illustrations. Price: 30s. (English).

"Fundamentals of Modern Allergy", edited by Samuel J. Prigal, M.D.; sponsored by the New York Allergy Society; 1960. New York, Toronto, London: McGraw-Hill Book Company, Inc. 9" × 5¾", pp. 714, with many illustrations. Price: $18.50.

"Shapes of Sanity: A Study in the Therapeutic Use of Modelling in the Waking and Hypnotic State", by Ainslie Meares, M.D., B.Agr.Sc., D.P.M.; 1960. Springfield, Illinois: Charles C. Thomas, Publishers. 9" × 5¾", pp. 480, with 191 illustrations. Price: £5 8s. (English).

"The Cell of Schwann", by Gilbert Causey, M.B., F.R.C.S., with a foreword by Sir James Paterson Ross, K.C.V.O., M.S., F.R.C.S., Hon., F.A.C.S., Hon., F.R.A.C.S., Hon., LL.D., Glasgow; 1960. Edinburgh and London: E. & S. Livingstone, Ltd. 8½" × 5½", pp. 132, with 40 illustrations. Price: 21s. (English).

"A Short Synopsis of Human Protozoology and Helminthology", by L. R. S. Macfarlane, O.B.E., M.D., M.A., D.P.H., illustrated by R. M. Leach, B.E.M.; 1960. Edinburgh and London: E. & S. Livingstone, Ltd. 8½" × 5½", pp. 260, with 61 illustrations. Price: 35s. (English).

"An Introduction to Pharmacology", by J. J. Lewis, with a foreword by Stanley Alstead, C.B.E., M.D., F.R.C.P.Ed., F.R.C.P.Lond., F.R.F.P.S.; 1960. Edinburgh and London: E. & S. Livingstone, Ltd. 8½" × 5½", with 163 figures and 28 tables. Price: 55s. (English).

"Ocular Vertical Deviations and the Treatment of Nystagmus", by J. Ringland Anderson, M.C., M.D., B.S., F.R.C.S.Ed., F.R.A.C.S., D.O.M.S., with a foreword by Sir Stewart Duke-Elder, G.C.V.O., M.D., D.Sc., LL.D., F.R.C.S., F.R.A.C.S., F.A.C.S.; second edition; 1959. London: British Medical Association. 9¾" × 6¾", pp. 206, with 60 illustrations. Price not stated.

"Childbirth Without Fear: The Principles and Practice of Natural Childbirth", by Grantly Dick-Read, M.A., M.D. (Cantab.); fourth edition; 1960. London: William Heinemann, Medical Books, Ltd. 8½" × 5½", pp. 280, with 16 illustrations. Price: 12s. 6d. (English).

"The Chess Mind", by Gerald Abrahams, M.A. (Oxon.); 1960. Mitcham, Victoria: Penguin Books, Pty. Ltd. 7¼" × 4¼", pp. 352, with many illustrations. Price: 7s. 6d.

"The Physical Health of Children", by Audrey Kelly; 1960. Mitcham, Victoria: Penguin Books, Pty. Ltd. 7¼" × 4¼", pp. 256. Price: 5s. 6d.

"Expert Committee on Addiction-Producing Drugs: Tenth Report", World Health Organization, Technical Report Series, No. 188; 1960. Geneva: World Health Organization. 9½" × 6½", pp. 16. Price: 1s. 9d.

"The Older Patient", by twenty-one authors, edited by Wingate M. Johnson, M.D.; 1960. New York: Paul B. Hoeber, Inc. 9½" × 6", pp. 606, with many illustrations and tables. Price: $14.50.

"Clinical Obstetrics and Gynecology", Volume 2, Number 4, December, 1959; "Cesarean Section", edited by Edwin J. de Costa, M.D., "Advances in Gynecologic Surgery", edited by S. B. Gusberg, M.D.; 1960. New York: Paul B. Hoeber, Inc. 9½" × 6", pp. 929-1228, with many illustrations. Price: $18 per year.

"Polysaccharides in Biology: Transactions of the Fourth Conference May 21, 22 and 23, 1958, Princeton, N.J.", edited by Georg F. Springer, M.D.; 1959. New York: Josiah Macy, Jr. Foundation. 9" × 6", pp. 328, 88 illustrations and 52 tables. Price: $5.95.

"The Hæmolytic Anæmias: Congenital and Acquired", Part I—"The Congenital Anæmias", by J. V. Dacie, M.D. (Lond.), F.R.C.P. (Lond.); second edition; 1960. London: J. & A. Churchill, Limited. 8¾" × 5½", pp. 348, with 118 illustrations. Price: 45s. (English).

"Cates' Primary Anatomy", by J. V. Basmajian, M.D.; fourth edition; 1960. Baltimore: The Williams and Wilkins Company. Sydney: Angus & Robertson, Limited. 10" × 6½", pp. 372, with 514 illustrations. Price: 71s. 6d.

"Handbook of Physiology: A Critical, Comprehensive Presentation of Physiological Knowledge and Concepts", Section 1: "Neurophysiology", Volume 2; editor-in-chief: John Field; section editor: H. W. Hagoun; executive editor: Victor E. Hall; 1960. Baltimore: The Williams and Wilkins Company. Sydney: Angus & Robertson, Limited. 11" × 8½", pp. 659, with many illustrations. Price: £11.

"Virus Virulence and Pathogenicity", in honour of Prof. J. Mulder, edited by G. E. W. Wolstenholme, O.B.E., M.A., M.B., M.R.C.P., and Cecilia M. O'Connor, B.Sc.; Ciba Foundation Study Group No. 4; 1960. London: J. & A. Churchill Limited. 7¾" × 4½", pp. 128, with illustrations. Price: 12s. 6d. (English).

"A Bibliography of Internal Medicine: Selected Diseases", by Arthur L. Bloomfield, M.D.; 1960. Illinois: The University of Chicago Press. 9¼" × 5¾", pp. 320. Price: $6.00.

"'H,' in the Battle Against Old Age: A Dramatic New Use for Novocain?", by Henry Marx; 1960. New York: Plenum Press, Inc. 8" × 5¼", pp. 234, with illustrations. Price: $4.95.

"The Biochemical Response to Injury", A Symposium organized by The Council for International Organizations of Medical Sciences, Established under the joint auspices of UNESCO and WHO; edited by H. B. Stoner with the assistance of C. J. Threlfall; 1960. Oxford: Blackwell Scientific Publications. 8¾" × 5", pp. 480, with many illustrations. Price: 57s. 6d. (English).

"Appraisal of Fellowships: Report of a Study Group", World Health Organization, Technical Report Series, No. 186; 1960. Geneva: World Health Organization. 9¾" × 6¾", pp. 16. Price: 1s. 9d.

"Psychiatry: Descriptive and Dynamic", by Jackson A. Smith, M.D., F.A.C.P.; 1960. Baltimore: The Williams and Wilkins Company. Sydney: Angus & Robertson, Limited. 9" × 6", pp. 352. Price: 77s.

The Medical Journal of Australia

SATURDAY, MAY 14, 1960.

COMMUNICATING WITH THE PATIENT.
I: RECEIVING.

WHEN we say that two people speak the same language, we sometimes mean that they both speak English or Arabic or Chinese or Choctaw. More often we mean that they really understand one another's thoughts and can convey them from one to the other. This is effective communication, and without it man's unique gift of language can be a barrier rather than a bridge. The Tower of Babel provides the classical picture of confusion, the confounding of language resulting in separation and scattering; but mere differences in dialect are only half the trouble, and the lesser half at that. The greater problem occurs when two people think that they speak the same language but in fact do not understand one another. Then is confusion worse confounded.

It can happen in medical practice. The patient can fail to convey his real troubles to the doctor, and the doctor can fail to gain the patient's understanding and so his effective cooperation in managing the situation. The fact that each has the same mother tongue is not enough in itself to establish communication. In both cases the onus of breaking down barriers is on the doctor. He must learn to read the message the patient is trying to pass to him—or even trying to conceal. He must get through the intellectual and emotional barriers that are blocking the patient's reception. He is in charge of the situation and cannot usually blame the patient if communication fails in either direction. For some doctors the establishment of effective communication is easier than for others, as natural gifts of patience, human understanding and ease of expression help a great deal, but ultimately it is a matter of technique. Ainslie Meares[1] has recently written helpfully about it, especially the aspect of finding out from the patient what he cannot convey by the logical use of words. Meares points out that it is only in the simplest cases that a medical consultation can follow the conventional plan of history-taking with satisfactory results. Especially when there is a psychosomatic component in the illness (and that is common enough), the whole business of communicating with the patient is something more complex. Meares likens it to a multi-channel system of communication between patient and physician, when each separate channel is communicating different information at the same time. The three principal channels are formed by literal verbal, extraverbal and non-verbal modes of communication.

Literal verbal communication is the obvious channel, but for that very reason is likely to mislead us in history-taking. It can divert our attention so that we miss important information communicated to us by other channels. Extraverbal communication is described as the communication of ideas which are conveyed by the implied meaning of words, as distinct from the logical content of the words—the meaning gathered from reading between the lines. There is no logical statement of the idea, Meares remarks. It includes innuendoes and those ideas which are communicated by the simple fact of their omission. It commonly depends on stress given to certain words or on the tone in which they are spoken. The spoken words may thus communicate two entirely different ideas—the logical and the inferred meaning. Meares makes the point that extraverbal communication is biologically a recently acquired ability. It is lost in conditions involving regression, such as schizophrenia. Because we are so accustomed to it, the doctor can unthinkingly use extraverbal means of expression and the patient fail to comprehend his meaning.

Non-verbal channels are in the form of unverbalized phonation, expression, posture and gesture, and behaviour. Meares stresses the fact that the grunts and groans, the "ums" and "ahs", of unverbalized phonation are not just the noises that a patient under stress of pain or emotion is likely to make. They have meaning. The ideas conveyed are never as clear and precise as those communicated by the logical use of words, but quite subtle shades of meaning can still be communicated. In contrast to extraverbal communication unverbalized phonation is more primitive than verbal communication and comes to be used mostly by patients who have undergone some degree of psychological regression, either as an acute reaction to stress of emotion or pain, or as a more chronic reaction. It is used to communicate primitive ideas of biological importance—love and hate, pain and fear, joy and sorrow. Another important channel is facial expression, by which the patient can unconsciously communicate his affect. Fear, great pain or gross anxiety are usually obvious, but more complex ideas can be conveyed. The patient may also use his expression consciously to communicate to the doctor, and communication may be both conscious and unconscious at the same time. Of particular importance is the fact that expression sometimes communicates ideas of which the patient is aware, but which he tries not to communicate. It is important, Meares points out, to learn to recognize to which category the patient's expression belongs, and to interpret the meaning when one expression is superimposed on another. The patient may consciously assume a composed expression and at the same time show unmistakable signs of anxiety. "A young man may tell us about his father with apparent nonchalance, while the tensing of his lips and the slight change of colour communicate the conflict which his words deny." In the same way a patient may consciously adopt a particular posture or certain gestures in order to convey meaning to the physician and may convey more than

[1] *Lancet*, 1960, 1: 663 (March 26).

he realizes. Meares states that the man who sits down, crosses his legs and lights a cigarette is telling the physician how relaxed and composed he is. It is important to appreciate such communications, he comments, as usually it is only an insecure person who has need to express himself in this way. Business executives may consciously cultivate a relaxed posture and expression to cover up a good deal of anxiety. The position of the wrist and fingers in these circumstances may be revealing. If the patient's hands project beyond the arm of the chair, the wrist falls into a fully flexed position if the patient is really relaxed; if there is much anxiety, the wrist remains extended. An act carried out in the presence of others may be used as a means of expression as well as fulfilling its purpose in reality. The way in which the act is carried out can be used as a means of communicating an idea; as a striking example of this, Meares quotes what the army calls "dumb insolence". Observation of behaviour is particularly important during physical examination, when the patient by his actions and attitude may communicate a good deal to the seeing eye. Silence also is a mode of behaviour which may convey a good deal.

Meares goes on to discuss the content of the communication in terms of the conscious communication of fact, the unconscious communication of conflict, the communication of affect, of attitudes and of habitual patterns of psychological defence, and appeals and threats to the physician. He also points out that some people show a tendency to use one channel of communication in preference to others. The tendency seems to be determined by racial and cultural influences, as well as by individual personality structure, and it is most important to recognize this if misunderstanding is to be avoided. Much of what Meares says applies primarily to psychiatric patients, but the sensitive and perceptive doctor will see its relevance to a great many of his own interviews. He will also see that the physician, in attempting to communicate with his patient, may adopt consciously or unconsciously various of the channels described. It is essential that he should understand what he is doing here, and we shall return to this on another occasion. Meantime, we commend Dr. Meares's article for careful study. Much of what he describes is not new, but few will have thought about it in such deliberate and orderly fashion. The advice given will be received gratefully by any doctor who appreciates the importance of getting the maximum amount of relevant information from a patient who may be able to convey by conscious speech very little of what he really wants to say.

Current Comment.

VIRUSES AND PERACETIC ACID.

THERE are many compounds available for cold sterilization which are fairly active against bacteria and, to a less extent, against fungi. Most of these have little or no effect against viruses. There is need for a fast-acting, non-toxic reagent which may be used against viruses. L. B. Kline and R. N. Hull[1] have examined a number of compounds to find such a substance and they recommend peracetic acid (CH_3COOOH).

Peracetic acid has been found to be highly active in the killing of bacteria and fungi and has been used as a germicide for spraying fruit and vegetables. For the killing of Type 1 poliovirus, peracetic acid was easily the best of a number of antiseptics tried, including even formaldehyde, both in the dilution necessary and in the time necessary for sterilization. Type 1 poliovirus was used because it was relatively resistant to formaldehyde. Nine other viruses were also found to be rapidly destroyed by peracetic acid. The dilution effective in the killing of these viruses in a short time (five minutes) was 0·04% of peracetic acid, while 5% of formaldehyde was necessary. Other peracids were nearly as effective, but none was better. Peracetic acid is sold as a 40% solution and is stabilized. A 2% solution of this was used for sterilization. This was 50 times the concentration of the minimal effective level observed to inactivate poliovirus in five minutes. Such a solution retained its activity for about a week at room temperature. The 2% solution is non-irritating to the skin and when used in small amounts anoxious. It has a pungent odour, but this soon passes off, or an alkaline spray can be used to destroy it. The solution blackens iron and galvanized iron and damages rubber to a slight extent as seen in reduction of resilience.

Paracetic acid should be considered for a decontaminating agent in places where the staff is working with infectious agents or is trying to maintain aseptic conditions, as in hospitals and laboratories, since, in addition to being very active against viruses, it is also very active against bacteria and fungi.

[1] *Amer. J. clin. Path.*, 1960, 33 : 30 (January).

ANTIBIOTICS TODAY.

"DURING the past fifteen years the discovery of several thousand antibiotics has been recorded. Those which have shown sufficient promise to justify the work of characterization number about three hundred, but only a dozen have passed into general use. Today, there is still a need for new antibiotics both to expand the range of therapy and to combat the emergence of resistance to established antibiotics on the part of some bacterial pathogens." So writes A. H. Campbell in one of a series of authoritative articles in a recent issue of the *British Medical Bulletin*.[1] And we might add that there is still a need also for general appreciation of the antibiotics we already have and of how they may be most effectively and safely used. This ground is well covered in the 15 brief but meaty articles of this symposium, which deal with the chemistry and classification of antibiotics, the nature of the selective toxicity, drug resistance and mechanisms for its development, the principles of therapeutic use of antibiotics, the laboratory control of antibiotic therapy, and pharmacology of antibiotics, the rationale and management of combined therapeutics in medicine and surgery, the chemotherapy of tuberculosis, the treatment of bacterial endocarditis, the dangers of antibiotic treatment, clinical problems of drug-resistant pathogens, laboratory use of antibiotics and the search for new antibiotics. No attempt is made to give a comprehensive account of the therapeutic use of antibiotics; with this, as Professor L. P. Garrod states in his introduction to the symposium, the issue could have been filled three times over. However, the principles are stated, and a nice balance is set between the need to avoid over-prescribing, which has been well hammered by everyone including many armchair critics, and the practical situation faced by the doctor in the hurly-burly of practice—for example (from an article by Garrod and E. F. Scowen):

> "It would be easy enough to conclude that antibiotics should never be prescribed for minor illness, but the problem is not so simple. What begins as a minor illness may develop into something more, particularly

[1] *Brit. med. Bull.*, January, 1960.

in certain predisposed patients. It would consequently be unwise to attempt a definition for hard-and-fast rules about conditions for which antibiotic treatment is justified. Each case must be judged on its merits, but if these are deliberately assessed, and if the treatment has an explicit rational basis, really indiscriminate use will thereby be excluded.

The stated aim of the symposium is to provide the reader with well-ascertained information, much of it not readily available elsewhere, on which he can base his own opinion.

Future developments in antibiotics present interesting possibilities. A. H. Campbell states that in the search for new antibiotics the earliest targets set were the bacterial pathogens unaffected by penicillin, screens being set up to search particularly for broad-spectrum and anti-tuberculosis substances. Soon they were augmented to select antibiotic activity against fungi and protozoa, and more recently interest has centred on substances active against viruses and tumours. Problems of staphylococcal resistance to the range of commonly used antibiotics have given renewed impetus to the search for new substances effective against Gram-positive cocci. Outside the fields of veterinary and human medicine, attempts are now being made to select antibiotics against pests and pathogens of plants, such as mites, insects, pathogenic fungi and nematodes.

SURVIVAL IN A THERMONUCLEAR WAR.

EVER since the nations embarked on their insane competition in demonstrations of their ability to explode bigger and better atomic and thermonuclear weapons, all sensible people have devoutly hoped that the occasion for the use of such weapons in actual warfare would never arise, though many have feared from time to time that the possibility that they may be so used is real and urgent. Many people, while acknowledging the reality of these fears, have adopted a purely fatalistic attitude, that there is nothing to be done about it anyway. In Australia, though there has been some important backroom planning, this attitude has been reinforced by a vague hope that, even if the worst comes to the worst, we shall be left as spectators on the periphery of the disaster. At the moment optimists might be excused for seeing some hope that the possibility of nuclear warfare is becoming increasingly remote. Nevertheless it is instructive to see how the danger is being faced in other countries. It is natural that the United States should regard themselves as being in particular danger, and it is not our intention to discuss the profound effects which this has had on their national activities. However, a recent article published in the *Medical Times* provides an interesting sidelight on how it affects some private citizens in that country. In this article[1] S. Garb sets out to describe how "the doctor, or indeed any other person, can increase his chances of becoming a survivor". The author begins by setting out the familiar statistics of the destructive effects of thermonuclear weapons, and then makes the important point that, in an unprotected population, radiation from fall-out would be likely to kill far more people than all other effects combined. This conclusion is based on the assumption that a bomb in the 20 megaton range would be used (in the relatively small atomic explosions at Hiroshima and Nagasaki fall-out was apparently unimportant). Those who were within the lethal range of the blast and heat would receive no warning, and their fate would be inevitable; but there would be a far larger number of people outside this range who would have anything from half-an-hour to six hours from the time of the warning flash in which to take refuge from the expected fall-out. Garb states that for adequate protection from radio-active fall-out a protective layer of two feet of concrete or three feet of packed earth is necessary. The type of shelter which he recommends is a corrugated steel pipe, four to six feet in diameter, buried under three to six feet of earth. He proceeds to describe the shelter and its accessories, with details of construction, cost, and where the various items may be obtained. The cost of the pipe alone ranges from $280 to $425, depending on the gauge of steel; ventilation is provided by a hand-operated blower which costs about $32. He discusses the question of water storage, and suggests that it would be prudent to store at least six months' food supply, pointing out that, if concentrated foods are bought, a six months' supply for one person can be stored in seven and a half cubic feet "and will cost about $73 in a supermarket, if wisely selected". It is not suggested that survivors would need to remain in their shelter for more than a few days, but the food store is to enable them to avoid starvation once the emergency has passed. Finally Garb recommends the purchase of a Geiger counter, presumably to enable survivors to know when the coast is clear, with a range up to 50*r* per hour. It appears that a suitable model may be obtained for $70.

It is difficult for us, with our comfortable feeling of remoteness, to take this sort of advice seriously. But it is a tragic commentary on contemporary world politics that Garb's article is written in all seriousness, that "there are several government publications describing shelters for the family", to which Garb refers, and that large numbers of his fellow countrymen are, we understand, acting on such advice. It is Garb's aim to urge that many more should do so.

[1] *Med. Times*, 1959, 87: 1438 (November).

A NON-TOXIC ANTI-TUMOUR REAGENT.

INTENSIVE SEARCH is going on in many parts of the world to discover a chemical substance which, when it has entered into the human body, will destroy cancer cells yet not damage normal tissue to any great extent. A large number of the substances which have been tried are derivatives of mustard gas, but while there have been some successes, in the sense that the tumour disappeared, in most cases the chemical is too toxic to normal cells. Many other substances have been tried, but much the same can be said about them all. Now I. Levi, H. Blondal and E. Lozinski[1] have examined some amino-acid derivatives to determine whether they will serve as antagonists in the metabolism of tumour cells. Since some antibiotics have been found which have, in a limited degree, the ability to destroy tumour cells in experimental animals, Levi, Blondal and Lozinski combined portion of the molecule of certain antibiotics with amino acids. The N-dichloracetyl group of chloramphenicol was chosen for experiment. Tested on the tumours of mice, the sodium salt of N-dichloroacetyl serine gave the best results.

In testing for toxicity it was found that four grammes of the salt per kilogram of body weight, injected intraperitoneally into rats and mice, produced no abnormal effects. One gramme of the salt per kilogram of body weight injected into mice for seven days produced no changes in the blood. Similar results were obtained with other animals. The serine compound was given to mice with actively growing sarcoma-37 in a dosage of one gramme per kilogram of body weight injected intraperitoneally. An equal number of inoculated mice were given no treatment. On the sixth day of treatment five out of ten treated mice showed complete regression of their tumours. On the twenty-fifth day seven out of ten treated mice had a complete regression, and in the other three the tumours were regressing. The tumours in the untreated mice continued to increase in size. There was no weight loss in the treated mice. The tumours of the treated mice became very small and hard as they retrogressed and finally sloughed off. This compound has not yet been investigated clinically in man, but in view of the lack of toxicity in a variety of animals and the success in making tumours retrogress in mice the outlook is very promising. Treatment of human patients with advanced malignant disease is now being carried out. It will be interesting, to say the least, to learn the result.

[1] *Science*, 1960, 131: 666 (March 4).

Abstracts from Medical Literature.

MEDICINE.

Arm-Chair Treatment of Myocardial Infarction.

N. O. ATUK, J. R. BECKURTH AND J. E. WOOD (*A.M.A. Arch. intern. Med.*, August, 1959) discuss the arm-chair treatment of myocardial infarction. Sixteen patients with acute myocardial infarction were studied. Between the first and sixth days after the onset of the infarction, patients were allowed to sit up in a chair for one-half hour twice daily for three days, and then one hour twice daily for three days. This was increased gradually until they were allowed to sit up *ad libitum*. At first the patients were allowed to sit on the side of the bed and to swing their legs; but no patients who had shock or pain at the time of the study were allowed to sit up. Ambulation was not allowed at any time during the first three weeks. Cardiac work estimations were made at intervals during the three weeks, by the Starr method, both in the supine and the sitting positions. With the exception of two patients, cardiac work was less in the arm-chair position, and the mean reduction of the cardiac work was 14·5%. Serum glutamic oxalacetic transaminase (S.G.O.T.) studies were done in several of these patients, and from observation it was evident that the arm-chair position did not result in any increased activity of the S.G.O.T. level in the serum. It is contended from this study that the arm-chair treatment is a safe and advantageous method of handling patients with acute myocardial infarction.

Carcinoid Heart Disease.

J. COSH, J. E. CATES AND D. W. PUGH (*Brit. Heart J.*, July, 1959) state that the association between heart lesions and metastasizing carcinoid tumours is now well established. It has been shown that secretion of 5-hydroxy-tryptamine (serotonin) by metastases in the liver cause the lesions in the right side of the heart, and also that an inactive breakdown product, 5-hydroxy-indole acetic acid, is formed, passes into the general circulation and is then excreted in the urine, where it can be measured. The authors report three further patients who had small malignant carcinoid tumours in the ileum with large hepatic metastases and lesions of the right atrium, and the tricuspid and pulmonary valves. Two died of congestive heart failure and cachexia and one of intestinal obstruction due to adhesions. Autopsy findings are described in detail.

Hypertension Treated by Nephrectomy.

D. M. DOUGLAS, K. G. LOWE AND R. G. MITCHELL (*Brit. Heart J.*, July, 1959) state that between 1937 and 1956, 575 cases were reported in which nephrectomy was carried out for proved or suspected unilateral renal disease with associated hypertension. With the use of strict criteria, namely fall of blood pressure to 140/90 millimetres of mercury or less for a period of at least one year after operation, 149 of these patients could be regarded as "cured" by nephrectomy. The commonest pathological lesions found were pyelonephritis, hydronephrosis, atrophic kidney and arterial occlusion. The authors describe three further cases of severe hypertension associated with unilateral renal disease. Two patients had hydronephrosis and pyelonephritis and one had hydronephrosis and renal arterial occlusion due to dissecting aneurysm. The patient with arterial occlusion appeared to have been definitely cured, the other two patients are also improved. The value of aortography is illustrated.

Electrocardiographic Studies in Asian Influenza.

T. C. GIBSON *et alii* (*Amer. Heart J.*, May, 1959) studied 87 university students who had clinical and serological evidence of Type A influenza virus infections related to the Asian strain. In 12 of these patients electrocardiographic abnormalities were discovered, including *S-T* segment changes, *T* wave flattening, and auricular arrhythmias. It was concluded that these changes, which were all of a minor nature, were due to transient myocarditis caused by the influenza virus.

Auricular Infarction.

J. FREUNDLICH AND L. R. SERENO (*Amer. Heart J., May, 1959*) state that infarction of the auricles is considered to be a rare condition and that the diagnosis is based mainly on the electrocardiographic changes which are transient, indistinctly marked and without definite specific signs. The authors describe two patients, in one of whom the correct ante-mortem diagnosis was based on striking changes in the *P* wave of the electrocardiogram. The authors review reported electrocardiographic changes, which include abnormal atrial rhythms, abnormal deformed *P* waves and deviations of the auricular repolarization complex.

A Variant Form of Angina Pectoris.

M. PRINZMETAL *et alii* (*Amer. J. Med., September, 1959*) focus attention upon an unusual variant of angina pectoris which appears to be associated with temporary recurrent spasm of a partially occluded coronary artery. In this variant chest pain is apt to come on at rest and is relieved by exercise. Electrocardiograms taken during attack shows striking *S-T* segment elevation simulating recent myocardial infarction, but this promptly reverts to normal upon cessation of the attack. The authors also discuss the prognosis and treatment of this condition.

Intraarterial Coronary Anastomoses.

B. PITT (*Circulation*, November, 1959) undertook a pathological study of 75 hearts in order to study the frequency of intraarterial coronary anastomoses of functionally significant size. Wax spheres of given size were injected into one coronary artery at a maximum pressure of 100 mm. of mercury and their rate of recovery from the opposite coronary artery was determined. Of the 15 normal hearts studied, only one was found to have functionally significant anastomoses. In those with occlusive coronary artery disease and infarction, anastomoses were found in 75% to 100% of cases. In hypotensive and valvular heart disease anastomoses were demonstrated in approximately 50% of cases. This study confirms that functionally significant anastomoses occur with great frequency in occlusive coronary arterial disease and other states of anoxia, including anæmia, cardiac hypertrophy, etc.

Primary Arteritis of Abdominal Aorta in Children.

R. J. DANARAJ AND WONG HEE ONG (*Circulation*, November, 1959) describe the clinical pathological findings in two children in whom a localized arteritis of the abdominal aorta had occluded both renal artery orifices to produce severe hypertension. The authors in their discussion compare this condition to primary arteritis of the aortic arch or Takayashu syndrome. The importance of diagnosis by means of aortography is stressed in view of possible surgical cure.

Prevention of Myocardial Infarction.

E. BAJUSZ AND H. SELYE (*Canad. med. Ass. J., January 23, 1960*) report experiments on rats which appear to indicate that oral pretreatment with potassium chloride and magnesium chloride offers considerable protection against the myocardial necrosis that follows ligature of coronary vessels.

Electrocardiographic Changes in Poliomyelitis.

R. T. MCREYNOLDS AND O. L. HUDDLESTON (*Arch. phys. Med.*, November, 1959) have carried out electrocardiographic examinations on 70 patients with severe anterior poliomyelitis. All except four of the patients were adults, and the examinations were made four to 12 months after the onset of poliomyelitis. None of the patients had a previous history of rheumatic fever or other cardiac disease prior to the onset of poliomyelitis. Of the 70 patients, 6% to 7% had persistent abnormalities in the electrocardiogram which were regarded as permanent. The changes affected the *S-T* segment and the *T* wave.

Hepatic Coma.

G. C. WILLIS (*Canad. med. Ass. J.*, January 23, 1960) describes his experiences in the diagnosis and treatment in 120 cases of hepatic coma. Mental aberration heralding the onset of coma was seen in 48 cases, the commonest symptom being maniacal behaviour. The use of potent drugs to control excitement quickly precipitates coma, and the author advises the immediate institution of treatment as for coma and the cautious use of chlorpromazine or reserpine to control excitement. The commonest known precipitating causes of hepatic coma were gastro-intestinal bleeding (31 cases) and pneumonia and other infections (13 cases). Abdominal paracentesis appeared to precipitate coma by removing large amounts of potassium from the body and thereby depressing the central nervous system. Treatment consisted of the following measures: (i) procedures directed towards the remedy of precipitating factors; (ii) a daily dose of

magnesium sulphate and an enema in order of get rid of putrefying material, which is the source of hepatic fœtor; (iii) a protein-free, high-fat, high-carbohydrate diet of about 2000 Calories, given by gastric tube when necessary; (iv) the addition of protein to the diet, the amount increasing by 20 grammes daily, as recovery occurs and tolerance improves; (v) the exhibition of tetracycline.

Scalene Node Biopsy.

R. L. AIKENS (*Canad. med. Ass. J.*, December 1, 1959) has analysed a series of 100 cases in which the lymph glands overlying the scalenus anterior muscle in the root of the neck were removed for histological examination as part of the investigation of pulmonary disease. Thirty-five patients were suffering from cancer of the lung and diagnosis was made from the "scalene node" in eight of these. Out of 22 patients with sarcoidosis, the diagnosis was made from the biopsy in 15. In 12 patients with pulmonary fibrosis or chronic pneumonitis the examination did not help to the diagnosis. In 15 of the patients the material removed for examination contained no lymphoid tissue, and the author comments that the amount of tissue removed must have been inadequate.

Carriers of Hepatitis Virus B.

H. HEISTÖ AND A. C. JULSRUD (*Acta med. Scand.*, July 25, 1959) report the cases of two blood donors who were silent carriers of hepatitis virus B and probably transmitted the disease to 10 recipients. The assumption that these donors are virus carriers is based on the frequency with which hepatitis occurred in patients who had received blood from them. One donor had given 41 donations of blood over a period of four and a half years, and of the recipients six had developed jaundice at intervals of two to three months after transfusion; 24 had not developed symptoms of hepatitis, and 11 had either died within the incubation period or could not be traced. The other donor had given blood on 26 occasions over a period of six years, and of the recipients four had developed hepatitis, nine had developed no symptoms, and no definite information was available about the remaining 13. The authors state that the expected incidence of hepatitis after blood transfusion at their hospital was 0·13 out of every 100 transfusions. Neither of the two donors had any history of jaundice, and exhaustive laboratory tests failed to reveal any conspicuous abnormalities. The authors discuss means of detecting such donors at the earliest possible moment so as to prevent the development of unnecessary cases of hepatitis.

Meralgia Paræsthetica.

W. R. GHENT (*Canad. med. Ass. J.*, October 15, 1959) reviews the literature on meralgia paræsthetica and describes an illustrative case. In this condition dysæsthesiæ are felt in the area of distribution of the lateral cutaneous nerve of the thigh, and are experienced as burning, formication, coldness or lightning pains, which may progress to hypoæsthesia or anæsthesia. Symptoms are present only when the patient is in the erect or supine position. The author discusses the regional anatomy and points out that various explanations of the condition have been advanced, but that the proper clue to the disease is to be found in Aird's account, in which it is stated that in cases of meralgia paræsthetica there is a congenital abnormality of the inguinal ligament. In this anomaly the lateral cutaneous nerve of the thigh passes between two fasciculi of the ligament instead of behind it, resulting in compression of the nerve when the patient is erect or supine. The condition can be cured by dividing the posterior fasciculus of the inguinal ligament and allowing the nerve to fall back into its normal position. These points are clearly illustrated in the case reported.

B.C.G. Vaccination and Leprosy.

K. YANAGISAWA (*Int. J. Leprosy*, October-December, 1958) reports on the effect of B.C.G. vaccination upon the occurrence of leprosy among 246 children accommodated in nurseries provided at leprosaria for all children of the families of leprous patients. These children were all apparently healthy when admitted, and after admission to the nurseries were kept separated from any leprous patients. The children were divided into the following groups: (i) those who were already tuberculin-positive when admitted; (ii) those who were tuberculin-negative and received repeated B.C.G. vaccinations and tuberculin tests; and (iii) those who were tuberculin-negative and received no B.C.G. vaccination. All groups were under observation for 12 years. The leprosy morbidity rates of the three groups were: (i) 5·1%; (ii) 1·5%; (iii) 47·2%. After examining the data, the author concludes that these differences are clearly significant, and draws attention to the fact that, while in the case of tuberculosis B.C.G. inoculation is effective only when it is performed before the occurrence of primary tuberculosis infection, in the present investigations it is highly probable that infection with leprosy preceded the B.C.G. vaccination in all children who received it. From this he concludes that leprosy can be prevented by B.C.G. vaccination even when the vaccination is performed after exposure to infection.

Leprosy in Papua and New Guinea.

D. A. RUSSELL (*Int. J. Leprosy*, January-March, 1959) presents some notes on the incidence of leprosy in the Territory of Papua and New Guinea. He states that in a population of about 1,800,000 there were, in mid-1958, 2272 known cases of leprosy and an estimated total of 6000 to 8000 cases. Among the known cases, the tuberculoid type predominates over the lepromatous type in a ratio of nearly 4 : 1. Segregation has been compulsory since June, 1954, but at present there is a tendency to relax these regulations in favour of selective isolation. Of the total of known patients, 2036 were resident in 11 leprosaria, the remainder being under treatment as out-patients. The leprosaria are all administered by missions with the help of a government subsidy. Treatment is by one or other of the sulphone drugs. The dosage employed has been rather small, usually 400 mg. per week, but results of treatment have been, on the whole, satisfactory in spite of cases of drug intolerance and frequent severe lepra reactions. The treatment of the neural complications of leprosy by physiotherapy and reconstructive surgery has as yet scarcely begun. Future policy and the problems and difficulties encountered are discussed. The greatest problem is the lack of trained workers.

Familial Narcolepsy.

D. D. DALY AND R. E. YOSS (*Proc. Mayo Clin.*, June 10, 1959) describe a large family in which narcolepsy is common. Personal interviews disclosed 12 cases of narcolepsy and three suspected cases in three generations of this family. Family recollections suggested that the father of the first generation had also suffered from the condition. The authors note that their experience with a large series of narcoleptic persons has disclosed a considerable number of families in which more than one member is affected. Of the 12 narcoleptic persons in the family under discussion, seven were males and five were females. The authors comment on the low incidence of cataplexy among affected members of this family. They conclude that in this family narcolepsy is an hereditary disorder, transmitted by an autosomal gene as a simple dominant factor with a high degree of penetrance.

The Hypoglycæmic Action of Sulphonylureas.

A. BÄNDER (*Germ. med. Monthly*, November, 1959) has investigated the way in which sulphonylurea derivatives exert their hypoglycæmic action and considers that the mechanism consists of a sensitization of glucose-sensitive receptors which cause the release of insulin. They also stimulate the new formation of alpha and beta cells and release adrenaline and nor-adrenaline from the medulla of the suprarenal glands.

Chlorothiazide in Hypertension.

C. C. BARTELS *et alii* (*J. Amer. med. Ass.*, August 8, 1959) discuss the hypotensive effects of chlorothiazide. They state that, in 10 previously untreated patients, the administration of 1·5 grammes of chlorothiazide daily for six days caused a fall in blood pressure. In 65 patients, chlorothiazide plus a ganglion-blocking agent (mecamylamine 2·5 mg. twice daily, reserpine 0·25 mg. twice daily, or hexamethonium) was given. Chlorothiazide was given in doses of 0·25 gramme once or twice daily as a rule. With this dosage a fall in serum potassium to 3·5 mEq/l. occurred in 43% of patients, and the dose of chlorothiazide had to be reduced or two to three grammes of potassium chloride given daily. The latter treatment was not always effective and frequently caused nausea. The authors state that symptoms of potassium deficiency may be minimal and their onset insidious. There is a special danger if digitalis is being given. However, the chlorothiazide therapy may allow ganglion blocking agents to be reduced or discontinued.

On the Periphery.

THE EVOLUTION OF THE STETHOSCOPE AND THE TECHNIQUES OF AUSCULTATION AND PERCUSSION.[1]

OVER two thousand years elapsed between the Hippocratic use of immediate auscultation, by means of which the succussion splash and pleural friction rub were recognized, and the invention of the stethoscope by René Théophile Hyacinthe Laennec (1781-1826). However, this invention, together with the monumental treatise on thoracic disease and pathology which followed it, began the series of great clinical discoveries and advances which was to revolutionize clinical medicine within a period of little more than 60 years.

Prior to 1818, Laennec had written or commented on mitral stenosis, parasitic worms, the ventricles of the brain, aortic aneurysm, paralysis of the lower limbs, angina pectoris, various other pathological and anatomical subjects, and medical "systems" such as those of Brown and Gall.[1]

In February, 1818, Laennec announced at a scientific society that he had under his care a patient with fluid in the chest in whom the succussion splash of Hippocrates was demonstrable. In May he began a series of lectures on auscultation with the aid of acoustic instruments in the diagnosis of thoracic disease; later in the same month he showed a patient with pectoriloquy audible on applying a cylinder of wood in the region of the right shoulder. A little over a year later his exhaustive *"Traité de l'auscultation médiate"* was published, less than three years after children playing in the Tuileries had given him the idea of using a tight roll of paper to examine a young woman with heart disease (September, 1816). It may be noted that his friend and teacher, G. L. Bayle (1774-1816), had used immediate auscultation for cardiac murmurs; Corvisart (1755-1821), another of his teachers, regularly employed percussion. After numerous experiments, with particular reference to materials, Laennec's final instrument was a wooden cylinder with a central canal, capable of certain modifications. A model of Laennec's original stethoscope is shown (Figure II), together with the descriptive plate from John Forbes's translation of 1829, and a diagram of the original and its early modifications. By the 1834 edition (Laennec died in 1826) the form of the stethoscope had been modified, chiefly by narrowing the section between ear and chest pieces. This change, with some later over-all shortening of the instrument, virtually established the pattern of the popular form of the monaural stethoscope until the end of the century. It is attributed to Pierre-Adolphe Piorry

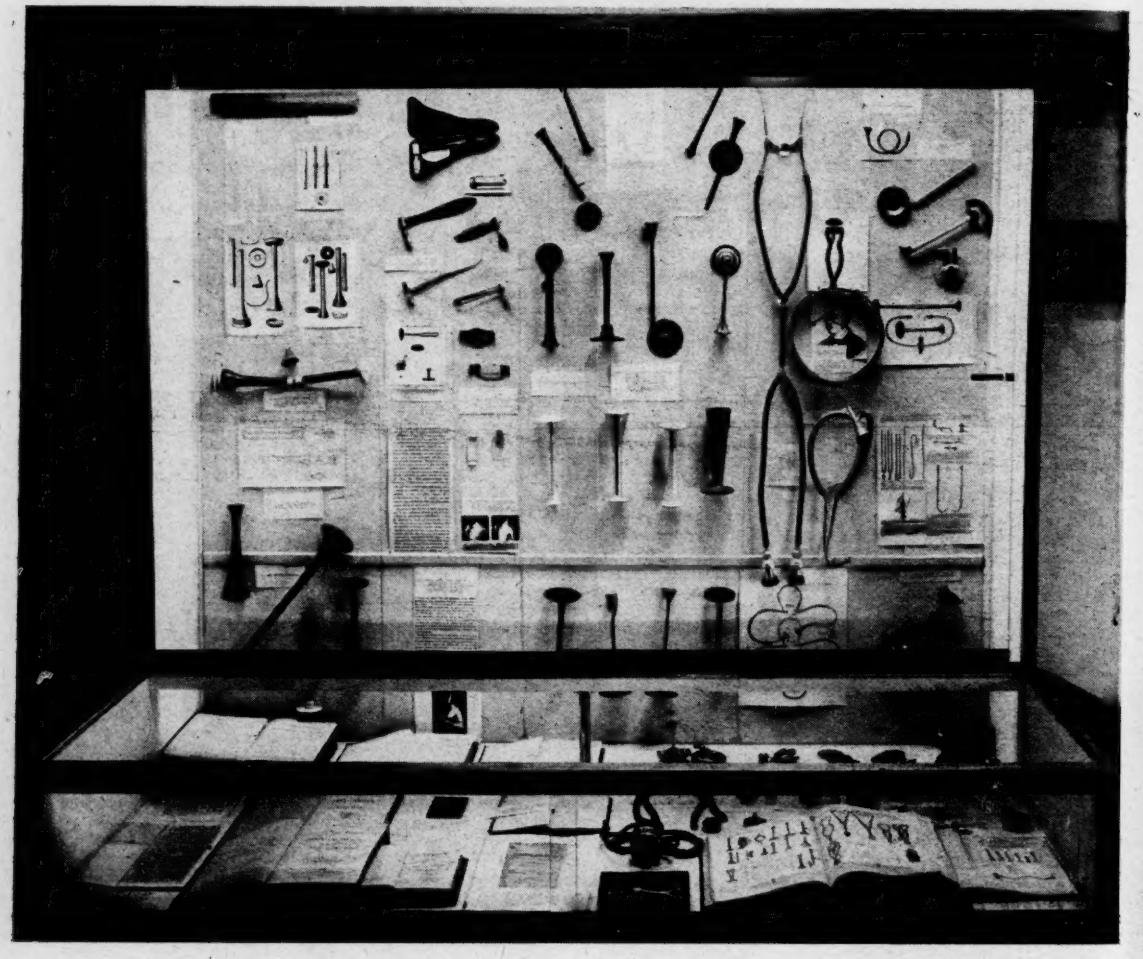

FIGURE I.
The display.

[1] A description of an exhibit of stethoscopes, old and new (Figure I), which has been on view at the headquarters of the Victorian Branch of the B.M.A. for the past year and which is being slightly enlarged to form part of the Scientific Exhibition at the Asian-Pacific Congress on Cardiology to be held in Melbourne from May 30 to June 3, 1960.

(1794-1879), author of an early treatise on mediate auscultation (1828),[2] from which the plate shown (Figure III) is reproduced; an ivory-ended stethoscope displayed is similar to this model. Piorry also modified the earpiece to give a closer fit. Experience showed that the ivory threads lacked durability, so that the fittings tended to produce extraneous noise. Although some beautiful stethoscopes of this design were constructed, they were probably not long in fashion for this reason.

The plate from Piorry's book also shows the pleximeter, an instrument which he devised to increase the accuracy

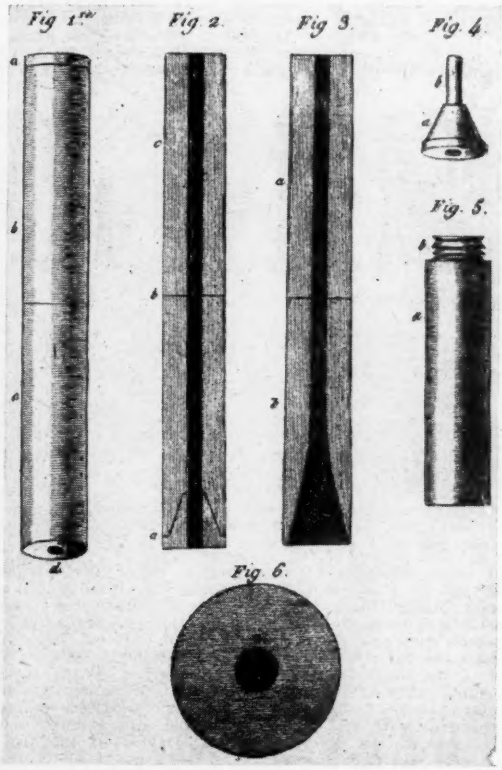

FIGURE II.
Diagram of Laennec's first stethoscope or *cylindre*, from his *"Traité de l'auscultation médiate"*, 1826.

of percussion as a diagnostic aid. It was applied to the chest wall and struck firmly by the finger; the tips rather than the pulps were used. The percussion hammer or plessor (plexor), used in place of the finger, was introduced by Anton Wintrich (1812-1882) in 1841. However, William Stokes in 1825 mentioned the use of the stethoscope as a plessor in immediate percussion[3] (surely a vigorous diagnostic technique, having regard to the contemporary structure of that instrument), and it is likely that he would have applied the same idea when using a pleximeter. Percussion had been used by Greek physicians to differentiate ascites and tympanites, but the principle was not applied to thoracic disease until Leopold Auenbrugger (1722-1809), of Vienna, tapped the chest with rigid, partly flexed fingers; he wore a glove to prevent any "smacking" sound. His discovery, published in 1761, passed almost unnoticed until 1808, when Jean-Nicholas Corvisart (1755-1821) drew attention in France to Auenbrugger's short monograph; an English edition, prepared by Laennec's translator, Forbes, did not appear until 1824. Piorry carried the use of percussion to extreme lengths and attached undue significance to the results; he claimed, for example, that each organ yielded a characteristic percussion note. However, he was the first to use percussion to outline the abdominal viscera, and he drew attention to the sense of resistance accompanying a dull percussion note. He and other early workers are said to have employed heavy percussion. J. B. MacDougall ("Percussion of the Chest", 1929) credits C. A. Ewald, better known as the originator of the "test meal", Sir William Gairdner and especially Georg Krönig, author of a paper dealing with this point in 1889 (*Berliner klinische Wochenschrift*, 26: 809) with the introduction of the more accurate technique of light percussion; but the use of this method is clearly set out in Paul Guttmann's "Handbook of Physical Diagnosis', a popular work translated into English in 1879. Other developments in regard to percussion, particularly associated with the name of Joseph Skoda (1805-1881), will not be described here, but it is perhaps not without interest that an unknown student from the United States of America is said to have devised the simplified method employing the middle fingers of both hands, one as pleximeter and the other as plessor.

Several forms of plessors and pleximeters are displayed (Figure IV), including two of the latter made by L. Bruck, an early surgical instrument supplier in Sydney. One of

FIGURE III.
Stethoscope designed by R. A. Piorry. Illustration from the 1834 edition of his book *"De la percussion médiate"*.

the stethoscopes displayed, believed to have belonged to Sir Charles Ryan, a prominent Melbourne surgeon, has a grooved earpiece to carry a rubber ring and to be used as a plessor (Burrow's pattern).

The value of the stethoscope was rapidly appreciated. Its early introduction in Britain may be attributed to the early translation of Laennec's work by John Forbes, at the instigation of Sir James Clark, to Sir James McGrigor's (1771-1858) use of the instrument in the British Army, to William Stokes's "Introduction to the Use of the Stethoscope" (1825) and later publications, and to Thomas Dodgson, who had seen Laennec at the Necker Hospital,

and who advocated the use of the stethoscope in his "Notes on Consumption" (1827). Stokes's influential "Treatise on the Diagnosis and Treatment of Diseases of the Chest" (1837) is important, not only for its clinical lore and its advocacy of the new diagnostic methods, but also for its insistence on the interpretation of the physical signs in terms of the symptoms, their character and duration; over-enthusiastic exponents of stethoscopy had brought the method into some disrepute by their excessive emphasis on the signs elicited. The copy of this work on display is inscribed by the author.

L. Martinet's interesting little volume, "Manual of Pathology together with an Exposition of the Different Methods of Examination Applicable to Afflictions of the

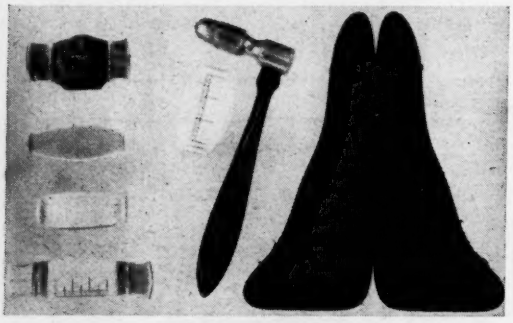

FIGURE IV.
Series of pleximeters in use in the nineteenth century, and a plessor and pleximeter in a case.

Head, Chest and Abdomen" (third edition, 1829), translated by J. Quain (1795-1851), describes as follows the technique of stethoscopy with the monaural instrument: "when using the stethoscope it should be held like a writing pen, the fingers being placed on the instrument as to feel at once its extremity, and the point of the thorax to which it is to be applied. It should also be placed evenly upon the surface, and perpendicular to it . . . we should wait until any impression this process may have made on the patient shall have passed away" before beginning the examination proper. The breath sounds and adventitious sounds were listened to with the "funnel" removed, but this was replaced before listening to the voice sounds. In general the heart was auscultated without what Stokes terms the "stopper". The now traditional "ninety-nine" is attributed, incidentally, to Samuel Gee (1839-1911). Other hints on the use of the monaural stethoscope were given by various authors; they include a warning to avoid excessive pressure, causing pain to the patient, plugging the examiner s opposite ear with cotton wool, and filling with lint the depressed intercostal spaces of emaciated subjects.

Frederick Watson credits Farquhar McCrae, one of the early doctors at Port Phillip, with the introduction of the stethoscope to Australia ("History of Sydney Hospital", 1914). His authority for this statement is not given, but it receives some support from the title page of the translation of Laennec's treatise on display, where McCrae's signature appears. Watson also observes that the stethoscope was not in common use in Australia until the 1860's, a date which seems unduly late in view of the interest in phthisis in the colony and of its early acceptance in Britain. The clinical notes kept at the Melbourne Hospital at this period record the auscultatory findings fully.

It will be appreciated that in the cylinder and later types of rigid monaural stethoscopes conduction of sound was through both the air column and the solid structure. The final structural modification of this type of stethoscope from the acoustic viewpoint was the substitution of the trumpet-shaped chestpiece for a simple cone. Piorry illustrates this, but it was stressed in England by C. J. B. Williams (1805-1889), whose "Pathology and Diagnosis of Diseases of the Chest" was a noted textbook for many years. An early modification is illustrated by a plate of the third edition of this work (1835), but he discussed the acoustic problems more fully before the Medico-Chirurgical Society in 1874 (from which paper, in the Society's *Transactions*, the diagram of his later model is taken), and in *The Lancet* in 1873. The latter essay contains some valuable historical notes and comments on the advantages and disadvantages of various designs. In general, the majority of later nineteenth century monaural stethoscopes follow the same pattern. Later modifications appear to have been guided by the need for ease of carriage. Various ingenious methods for reducing the instrument to a convenient size and shape for the pocket or top hat are shown, together with a clip to attach it to the interior of the latter (through the crown). The accompanying disadvantages were risk of breakage, if it was of wood, and the introduction of moving or locking parts liable to produce extraneous noise and to suffer wear and tear.

Partly for these reasons a variety of materials was used, although wooden stethoscopes were regarded by most authorities, including Laennec and Williams, as acoustically the most efficient. Hawksley introduced an all-metal one in 1873; Laennec had mentioned as one of the disadvantages of metal or glass instruments that they felt

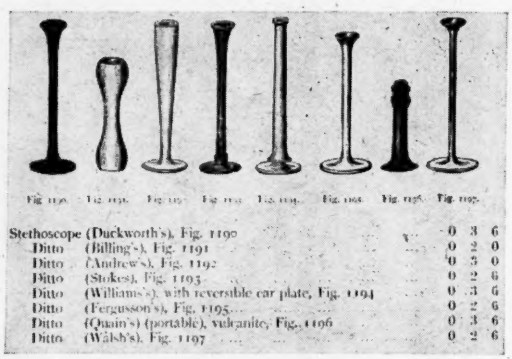

Fig. 1190.	Fig. 1191.	Fig. 1192.	Fig. 1193.	Fig. 1194.	Fig. 1195.	Fig. 1196.	Fig. 1197.	Fig. 1195.

Stethoscope (Duckworth's), Fig. 1190		0	3 6
Ditto (Billing's), Fig. 1191		0	2 0
Ditto (Andrew's), Fig. 1192		0	5 0
Ditto (Stokes), Fig. 1193		0	2 6
Ditto (Williams's), with reversible ear plate, Fig. 1194		0	3 6
Ditto (Fergusson's), Fig. 1195		0	2 6
Ditto (Quain's) (portable), vulcanite, Fig. 1196		0	3 6
Ditto (Walsh's), Fig. 1197		0	2 6

FIGURE V.
Series of monaural stethoscopes from Arnold and Sons' Instrument Catalogue, 1895.

cold on application to the chest. Other variants were described by Fergusson, Walsh, Marriott, Ward and Veale, among others;[2] it is difficult now to locate the original descriptions in many instances, and the advantages claimed for each instrument are sometimes not obvious. A popular and simple variety was that of Lloyd Roberts (Figure VI); one of the examples illustrated was given to Dr. R. Scot Skirving, of Sydney, by one of his Edinburgh teachers. Students were doubtless grateful for the rigid monaural stethoscope with two earpieces jointed into a single chestpiece, which was described by H. Davies in 1862 in the *Medical Times and Gazette*.

The classical account of the fœtal heart sounds is that of Lejuineau de Kergaradec in 1822 (*Journale de physiologie expérimentale et pathologique*); but the small treatise exhibited, "On Obstetric Auscultation" (1839), by H. F. Naegele, contains several interesting passages; the title page carries the name of D. J. Thomas, one of Melbourne's leading practitioners of the early days, and the date 1841. Naegele preferred mediate auscultation to the direct method (he used Piorry's stethoscope), giving as one reason that to use the ear directly the doctor must put himself in a position "often exceedingly incommodius, and likely to occasion congestion about the head". The stethoscope of Adolphe Pinard (born 1844), described about 1876, of which several examples are shown, is still in common use, although its advantages are not obvious.

Under the heading of "New Inventions", *The Lancet*, in October, 1875, referred to a new flexible monaural stethoscope, and several variants were ultimately described (Figure VII). The tubing was at first of gutta-percha, later of rubber or jointed metal; the earpieces, sometimes made of glass, were self-retaining and essentially of modern design. One such as Golding Bird's, retaining the old virtually flat earpiece, must have been distinctly awkward to use (Figure VII). The use of a bell chestpiece in stethoscopes of this type was a natural development from the thoracic end of the rigid monaural stethoscope. It is, of course, to be noted that the use of flexible tubing implied some change in principle, for sound conduction was then almost wholly through the air column.

[2] One of the best illustrated catalogues of the period is that of Arnold and Sons (1895). Nearly 70 stethoscopes are listed (44 monaural) and 41 are illustrated.

The first flexible binaural stethoscope to come into common use was that described in 1855 by George R. Cammann in the *New York State Medical Journal*. It had a bell chestpiece and earpieces similar to those of today. In place of some form of spring keeping the earpieces together (an invention of the 1890's) and hence in position, was a broad rubber band; in some models malleable metal was used which could be bent so as to keep the earpieces in any desired position. A year later (1856), J. E. Pollock in *The Lancet* discussed this new instrument and its role; he also referred to earlier attempts to produce a "double" instrument and to use flexible tubing. G. L. Carrick, physician to the British Embassy at St. Petersburg, in a later paper on the differential stethoscope (*Edinburgh Medical Journal*, 1873), also refers to the early history of the binaural instrument, and one paragraph is worth quoting:

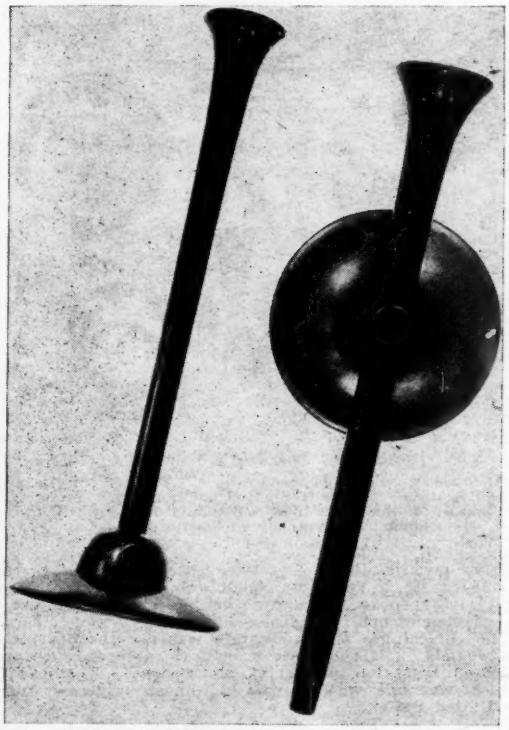

FIGURE VI.

Lloyd Roberts's portable stethoscope. One of the stethoscopes illustrated belonged to the late Dr. R. Scot Skirving.

The principle of binaural auscultation was first demonstrated by Dr. Leared, who exposed, at the Great International Exhibition of 1851, an instrument by means of which sounds produced at one part of the chest were transmitted to both ears simultaneously. Dr. Leared's stethoscope was made of gutta-percha entirely. It consisted of a hollow cylinder, expanding into a cup (which was applied to the patient's chest) at one end, while to the other were attached two immovable tubes. The free extremities of these tubes ended in circular flat ear-pieces, like those of the ordinary stethoscope. In the same year (1851), Dr. Marsh of Cincinnati published a description of a binaural stethoscope, of which he was the patentee as well as inventor. The idea, however, of auscultating with both ears at once, had previously occurred to many physicians, while by some it had even been carried into practice. Dr. C. J. B. Williams informed Dr. Alison that, many years prior to 1851, he was in the habit of exhibiting to his class an instrument which he had constructed for binaural auscultation. In all these stethoscopes, however, there was no self-adjustment. Moreover, they were heavy, unwieldy, and inflexible. Their ear-pieces were like those of the ordinary stethoscope, i.e., plane or concave gutta-percha or wooden discs, instead of the small rounded ivory knobs now in use. The latter, by entering the meatus auditorious externus, conduct sound infinitely better than the former, which simply press against the pinna. All these defects detracted largely from the value of what would otherwise have proved most useful instruments, and prevented their introduction into general practice. Binaural auscultation as a practical art may be said to date from the year 1852, when Dr. Cammann of New York described his flexible stethoscope. It is constructed upon precisely the same principle as Dr. Leared's instrument, but differs from the latter,—1st, In having the tube flexible at one part; 2d, In small ivory knobs supplying the place of the ordinary ear-pieces; and, 3dly, In being kept in position by a moveable joint and elastic band, thus leaving the auscultator one hand free. These were

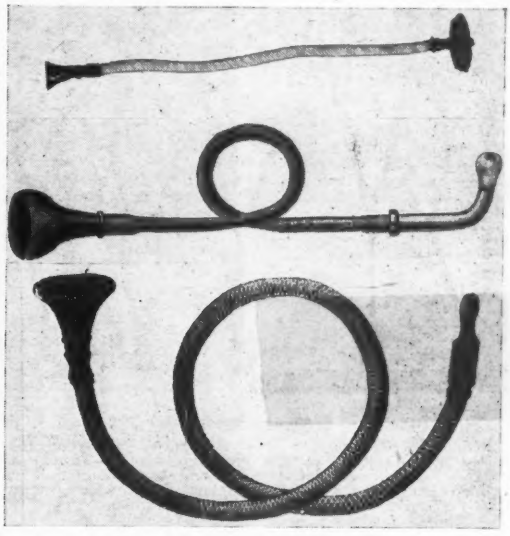

FIGURE VII.

Flexible monaural stethoscopes. From top: 1, Golding Bird; 2, Sir Andrew Clarke; 3, Reid and Morrison.

improvements sufficiently important to convert an unpractical instrument into a very practical one.

Carrick also suggests that Marsh's instrument was merely an unacknowledged copy of one devised by Landouzy in Paris. Writers after Cammann repeatedly stressed the importance of good fit of the earpieces, a point often overlooked in teaching students today; prior to the development of malleable metal or spring connexions for rigid aural tubes, the need for a good fit was an argument in favour of wholly flexible tubes.

In 1858 Professor John Tyndall discussed Dr. Scott Alison's "differential stethoscope" before the Royal Society. This elaborate instrument is virtually a double instrument, with two chestpieces to allow the ready comparison of sounds at two different parts of the chest; Carrick's paper, previously cited, describes its advantages at length. The efficient use of this instrument depends on equal auditory acuity in both ears, which many clinicians would not possess; but this difficulty is not mentioned in several papers relating to its use. A somewhat similar instrument, the symballophone, was described by William J. Kerr, of San Francisco, in 1937 in the *American Heart Journal*.

The binaural stethoscope (Figure VIII) was by no means speedily or universally adopted. The chief advantage was considered to lie in the ease with which the chestpiece could be moved under vision and with the minimum disturbance of the patient; whether or not it was preferable from the technical or auscultatory point of view was a matter of some debate. In 1902, in *The Lancet*, H. E. Syers reviewed its disadvantages—notably the distortion of sound and loss of sensitivity to high tones—in a paper

entitled "The Decay of Auscultation and the Use of the Binaural Stethoscope". He indicated that the instrument was not commonly used in England until the 1880 s. Even in 1910 it was stated that the monaural form was used "almost exclusively" outside the United States, where its early popularity is attributed in part to Sir William Osler.[4] In Melbourne, Morton recalls that the binaural form was not used before about the turn of the century.[5]

In the Victorian era, a period of elaboration and decoration in medical instruments as well as in other fields, many remarkable variants were described. Hillard's chestpiece (*British Medical Journal*, 1875) could be attached to the examiner's head, thus leaving the hands free for auscultatory percussion, or for moving a tuning fork applied to the chest—two methods of defining the borders of solid viscera. A modern form of fœtal stethoscope is shown to illustrate this type of attachment. E. T. Aydon Smith's model (*British Medical Journal*, 1884) could be used as a monaural, binaural or differential stethoscope, an otoscope (the chestpiece), an enema or œsophageal tube, a tourniquet or a catheter. Similar "multi-purpose" monaural stethoscopes had been described (e.g., Power's combined stethoscope, nasal or aural speculum, ophthalmoscope and reflector, with attached thermometer), (*British Medical Journal*, 1882; see also *Medical Times and Gazette*, 1879), but rarely became popular enough to justify illustration in catalogues. A cup-shaped chestpiece, an example of which is shown, was described by Cartwright Reed (*The Lancet*, 1874). Its advantages are not clear, but he also put a thumb-rest on the outer surface so that the chestpiece could be kept in position by thumb pressure alone, thus avoiding extraneous sounds produced by finger movements. At this time bells were made of wood, ivory, celluloid or hard rubber, among other materials. An extreme curiosity was Scott Alison's hydrophone, the chestpiece of which was a water-filled rubber bag; there is a full description of the instrument and its acoustic properties in *The Lancet* of 1859.

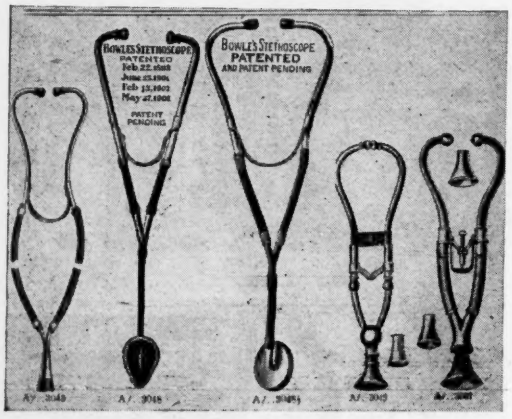

FIGURE VIII.

Binaural stethoscopes. The illustration is from the seventeenth edition of the catalogue of L. Bruck, a Sydney instrument maker. From left to right: 1, Albion; 2, Bowles's flat-iron pattern; 3, Bowles's round pattern; 4, Cammann; 5, Dennison.

The next major change occurred in 1894, when Aurelio Bianchi described the phonendoscope,[6] a term subsequently applied to most early forms of what are essentially diaphragm chestpieces (Figure IX). A simple diaphragm chestpiece is not illustrated prior to the description of the phonendoscope, and, indeed, the earliest illustration to my knowledge of a simple vulcanite diaphragm, fitted to a bell, is in a catalogue of 1900. Pollock (*The Lancet*, 1856) mentions an American attempt to use a chestpiece "membrane" in 1850; Sahli (1906)[7] refers to the early use of a rubber membrane, notably by König, and Gee (1883)[8] mentions that the "microphone" has so far proved of no value in auscultation. It would seem that the modern diaphragm attachment evolved gradually from its more complicated parent form, the phonendoscope. I have not been able to see a copy of Bianchi's paper on his instrument, an English translation of which appeared in 1898. Various models appeared, some of considerable complexity. The relative intensity of the heart sounds could be determined by altering the pressure on the diaphragm; in one model exhibited there is a calibrated device acting through a needle in contact with the diaphragm at one end and attached to a baseplate on a screw thread at the other. Another form was the metal stethonoscope, also on display. The narrow bell, of about one centimetre diameter, attachable to the common form of phonendoscope, aided accurate localization of sounds and appears to have been separately described by Fox about this time.

I have been unable to trace the original description of the popular Bowles's chestpiece, which was patented in 1898. It was the first, or one of the first, to have a diaphragm (of metal or celluloid), although this was not always used; it was sometimes described as a phonendoscope or resonating stethoscope. An early description describes it as circular or of "flat-iron" shape; probably an essential feature was the relatively large surface area concave towards the chest (later associated with circular ridging), with a relatively small volume of enclosed air. Sahli (1906) spoke for many when he derided the use of the phonendoscope; he stressed that the chief difficulty in the clinical use of auscultation was not the hearing of the sounds. His American editors differed, for they indicated that the "resonating stethoscope", of which the Bowles' was one variety, was in almost universal use in the United States.

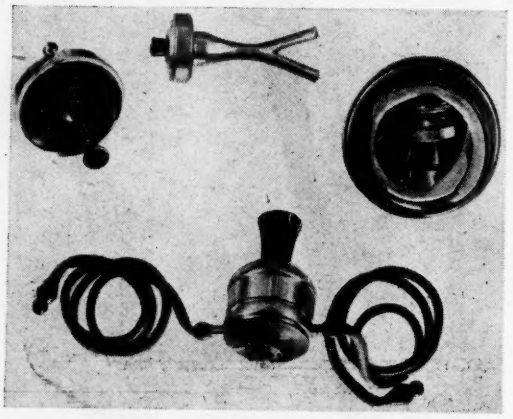

FIGURE IX.

Stethonoscopes and phonendoscopes. Top row: 1, Bazzi and Bianchi's phonendoscope; 2, stethonoscope, probably Teske's; 3, miniature portable phonendoscope. Below: complicated variety of phonendoscope.

The modern form of Sprague-Bowles combination chestpiece was described by Howard Sprague, of Boston, in *The Journal of the American Medical Association* in 1926. A modification, incorporating two bells of different sizes, has recently (1958) been described by Aubrey Leatham in *The Lancet*. An earlier form of double-ended chestpiece was known as the revolving or Meredith chestpiece; the bell and diaphragm chestpieces were mounted opposite to one another, with a common chamber to which the aural leads were attached in such a way as to serve as an axis on which the chestpieces could be rotated. One example on display employs this principle to combine two bells of different sizes, the upper bell, not in contact with the chest, being occluded by the thumb during use.

The stethoscope of the modern physician is frequently completed by a rubber ring fitted to the bell. This was described in *The Lancet* by James Murray in 1889, the advantages claimed being a better fit to the chest wall and greater comfort for the patient. Today it has the additional value of preventing chipping of bells made of inferior modern materials.

Acknowledgements.

Loans or gifts for this display were made by Professor K. F. Russell, The Royal Australasian College of Physicians, Drug Houses of Australia, Dr. F. M. C. Forster and Dr. J. Austin. Other items have been donated to the Museum in the past, while the Honorary Curator's personal collection, which forms the basis of the exhibit, owes much to

many private firms and individuals. Much of the work connected with the exhibit was carried out by Miss Ann Tovell, to whom my thanks are due. Further donations would be greatly appreciated.

BRYAN GANDEVIA.

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Out of the Past.

THE MEDICAL SOCIETY OF QUEENSLAND.[1]

Extracts from the Final Address of the Last President, David Hardie, M.D.

[From the *Australasian Medical Gazette*, January 20, 1900.]

TONIGHT another year has been added to the life of this Society, tonight its career, under its present name, comes to a close. It seems to me therefore appropriate, that instead of giving the usual valedictory address, I recall to your mind something of the history and work done by the Society since its inception. . . .

The history of the Society dates as far back as 1871. On looking over old records, we find that it then consisted of eleven members, Dr. Cannan being the president, Dr. Bell treasurer, and Dr. Joseph Bancroft secretary. It is quite clear that the main burden of the work of the society fell upon the general secretary, for in addition to other specified duties, the rules provided that he "shall attend all meetings of the Society and of the Committee." No record of the work of the Society has been kept, but it is reported that "it became disorganised in consequence of an attempt on the part of a member to open up a discussion of a public nature on the relations between the medical profession and chemists with reference to prescribing and dispensing," and after an existence of nine months, it succumbed, leaving a balance of over £5 in the Savings Bank.

In 1882 . . . an attempt was made by Dr. Taylor, Dr. Patrick Smith, Dr. Rendle, and others, to resuscitate the Society. Nineteen names were enrolled, and eight joined subsequently, the president being Dr. K. I. O'Doherty, and the secretary Dr. Smith. It is curious to note that the president did not always occupy the chair even when present at the meetings, and that his inaugural address was delivered in the middle of his term of office. The subscription for membership was two guineas, but we are told that of the total number of twenty-seven members only nine paid their subscriptions. Certain bye-laws were drawn up, one of which provided that the annual meeting should take place in May, but this annual meeting never took place, for after an existence of ten months the Society suffered the fate of its predecessor. Nor was this due to lack of energy, for I find a record of as many as three meetings in one month, or a total of fourteen; while the liveliness displayed at the meetings was in keeping with their number. . . .

In October, 1886, a final attempt was made to reorganise the Society, and the step was hailed with approval by the unanimous voice of the profession . . . Profiting by past experience, it was recommended by the executive council, and approved, "that as the Societies of 1871 and 1882 both appear to have become disorganised in consequence of the introduction of questions of ethics and other matters not essential to the existence of the Society, it is suggested that the present Society shall confine itself definitely during the first year or two to the discussion of more purely scientific subjects, and that other questions such as ethics, legislation, etc., shall not for the present be discussed." This augured well for its future success—a success that was still further assured from the fact that the late Dr. Joseph Bancroft occupied the presidential chair for the first year, and Dr. Wilton Love took up the arduous duties of secretary. In Dr. Bancroft the members had, as president, one whom they one and all respected and admired, who as a pure scientist stood head and shoulders above any of his colleagues, and whose work had already gained world-wide recognition. His originality in thought and work was of exceptional brilliance, and on every hand stood out boldly as characteristic of the man. . . .

[The address deals in detail with the manifold scientific activities of the Medical Society and concludes thus:]

. . . The work of the Society as the Medical Society of Queensland now draws to a close, and if we feel, as I believe we honestly do, that during these few years we have helped each other in our struggle through life and assisted somewhat in advancing the cause of medical science, we may well be satisfied. Henceforward we shall be one with our colleagues of the Queensland Branch of the British Medical Association, and we trust and believe that this bond of union is but the outward expression of that larger union of spirit that will link together the units of the reconstituted and corporate body; stamp their actions as befitting the representatives in this colony of a great and worthy profession; and embrace Ruskin's "great principle of brotherhood, not by equality nor likeness, but by giving and receiving; the souls that are unlike . . . and the natures that are unlike, being bound into one noble whole by each receiving something from and of the others' gifts and the others' glory."

[1] From the original in the Mitchell Library, Sydney.

Correspondence.

HAMMAN-RICH SYNDROME (DIFFUSE INTERSTITIAL PULMONARY FIBROSIS).

SIR: I should like to offer several comments on the paper on the Hamman-Rich syndrome by Dr. Maxwell and Dr. Campbell in THE MEDICAL JOURNAL OF AUSTRALIA of April 16.

They rightly point out that patients with a more chronic form of the disease are commoner in clinical practice than those with the acute progression described by Hamman and Rich; but they refer to "relentless progression of dyspnœa in patients . . . who exhibit cyanosis, clubbing of the fingers and toes and diffuse râles". The picture should be completed by reference to the group of patients with this condition, usually in middle or late life, in whom dyspnœa is minimal to moderate, progression is hardly perceptible, and who may have no cyanosis, finger clubbing, or abnormal signs in the chest. Scadding[1] has recently given an excellent account of some such cases, and I have several under my own care.

I would quarrel with the authors' assessment of the response of their patients to steroid therapy (Table I). The protocols of Cases I, II and III hardly allow the response to be adjudged as "fair" even on subjective grounds. The "very good" response in Case V was not substantiated by the objective evidence of the pulmonary function tests. Dr. H. J. H. Colebatch and I have already[2] commented on the response in Case VIII. The indications for, and usefulness of, steroid therapy in this condition are still very much *sub judice*, and the authors generalizations do not clarify the matter. "The patients who respond are those in whom the condition is diagnosed early . . . when the fibrous tissue is immature." Case V they regard as unusual in responding (*sic!*) to steroids when the fibrosis was already "chronic" (but no pathological material was available). It is an attractive hypothesis that only patients with "recent" disease will improve with steroid therapy, but there is little sound evidence on the subject. Several of Scadding's "chronic" patients improved objectively on steroid therapy; and one has seen acute progressive disease which has not responded. We have indeed seen acute interstitial pulmonary fibrosis develop *de novo* within three months in a patient with scleroderma who was receiving prednisone for her under-

[1] *Brit. med. J., 1960, 1 : 443.*
[2] MED. J. AUST., 1959, 2 : 261.

lying disease (Read, Colebatch and Viner Smith: submitted for publication).

The tests of pulmonary function are difficult to reconcile with orthodox concepts. As an arithmetical exercise, it is quite impossible to reconcile the results for maximum *breathing capacity with the stated percentage of the vital* capacity expired in one second (F.E.V., Table III) in Cases I, II, IV and V. As an example: Patient II can forcibly *expire 24% of her vital capacity (or 794 ml.) in one second.* Allowing her to maintain this rate, and denying her any time to inspire, she can only move 48 litres of air in the *60 seconds available per minute. Yet we are told that her* maximum breathing capacity is 79 litres per minute. One may apply the same improbable situation and find the *same improbable answers in the other three cases* mentioned.

The statements of arterial carbon dioxide content without blood pH or derived arterial carbon dioxide tension are of no great value in assessing carbon dioxide response to exercise.

In a review article of this type, it is surely reasonable to mention lung compliance and pulmonary diffusing capacity *—the two investigations which will specifically incriminate* interstitial pulmonary disease—even if they were not available to the authors. These investigations are becoming *more freely available in Australia today, and reference* should at least be made to them in a balanced appreciation of the vital part which can be played by the laboratory in the diagnosis and assessment of interstitial lung disease.

Yours, etc.,

Department of Medicine,
University of Sydney,
Sydney.
April 20, 1960.

JOHN READ.

HAZARDS OF DOMICILIARY TREATMENT OF TUBERCULOSIS.

SIR: *Any patient who is newly diagnosed at the present* time as suffering from tuberculosis in countries such as Australia, and who has organisms which are sensitive to *the standard drugs, can anticipate the almost certain* success of his treatment and a risk of relapse that is reduced to almost nil.

At the recent trial in Madras,[1] in which PAS and isoniazid were used for both hospital and home patients, and which illustrated the part that domiciliary treatment can play in India at the present juncture, when the number of cases is very large, the number of hospital beds very small and facilities inadequate, the results showed that 10% of all patients remained positive after one year or had died. Three of 163 patients had died of tuberculosis within the year, and 10% of survivors had isoniazid-resistant bacilli within the year's treatment. In India, domiciliary treatment will be invaluable at the present time for the very large number of cases who would otherwise have to wait in vain for hospital beds and optimum treatment. The number of resistant cases thereby created may well be outweighed by the many lives saved.

Where, however, hospital facilities and optimum chemo*therapy are available and used, the individual patient can* expect, and does obtain, a near 100% success of treatment, and the community the safeguards which are necessary. *With the very high standard of control of the spread of* tuberculosis infection that has been achieved in Australia, the tuberculin-negative population is considerable and *increasing, and such safeguards have to be much more* stringent than in India, where the number tuberculin-negative is small even in childhood, and more rigid than *in the United Kingdom, where conditions are different and* have not reached the Australian stage.

Even in the trial conducted by the Research Committee of the Tuberculosis Society of Scotland,[2] this problem raised grounds for debate; and, under the conditions here of the very low tuberculin positivity in all age groups, the principle of the domiciliary treatment of tuberculosis, even if in general it were applied only to mild cases initially negative, could carry a significant public health risk. It has been proved that patients whose sputa or laryngeal swabs are initially negative even on culture have a much higher proportion of tuberculin-positive contacts than is expected, showing without doubt that the risk of infection from even these negative cases before treatment, is by no means negligible (van Zwanenberg[3]).

An additional, and possibly incremental, public-health risk is revealed by examination of the hazards that can occur *to the individual patient from domiciliary treatment, and* results from the development of drug resistance, which could lead in time to the spread of resistant organisms in *the community. Resistance to one or more of the standard* drugs—one of the greatest tragedies that can befall a tuberculous patient—can arise from failure to take drugs *regularly or in proper dosage at home, or complicate* a case already primarily resistant to streptomycin, PAS or isoniazid.

A high proportion of individuals on out-patient treatment fail to take PAS regularly or in correct dosage (Dixon, Stradling and Wootton[4]), and drug resistance can occur even if PAS and isoniazid are dispensed in the same cachet (Simpson[5]). In some of these resistant cases, the *first positive cultures were obtained only after many* months of out-patient chemotherapy. In addition, a patient may have a negative sputum although he harbours resistant bacilli as revealed by resection or later relapse (Stewart[6]).

At Hammersmith, Poole and Stradling[7] have found that the majority of their series of resistant cases were due to this factor, and these reasons for the resistance were equally readily found in all three groups of cases (slight, moderate and advanced).

Yours, etc.,

Morris Hospital,
Adelaide.
April 23, 1960.

S. GILLIS.

HYPOTHERMIA IN CARDIAC SURGERY.

SIR: *May I congratulate Dr. B. S. Clifton on his excellent* paper "Hypothermia in Cardiac Surgery". Like him, I believe hypothermia has a steadily diminishing place in *cardiac surgery. Certainly it is not necessary for open* pulmonary valvotomy, nor is heparin and fluothane. At the Royal Children's Hospital, Melbourne, open pulmonary *valvotomy is performed at normal temperatures with* routine anæsthesia, and is found to be an easy, safe, routinely successful operation.

Undoubtedly of the three good methods of attacking atrial septal defect (by-pass, hypothermia and atrial well), the well method is the best. One's reasons for believing this are:

1. Only one bottle of citrated, not necessarily fresh, blood *is used per case.*

2. Routine anæsthesia is used, and the operation is of much shorter duration than when either by-pass or hypothermia is used.

3. At this hospital there have been no arrhythmias *during or after the atrial well operations. All cases have* had a very smooth convalescence, have got out of bed on the first day and been discharged home on the tenth day.

4. There has been no death at this hospital and no morbidity, except one thoracotomy for hæmothorax.

5. Better repair is achieved with the well than during a hurried direct suture with hypothermia. Several atrial septal defects pulled apart in one series with which I was associated in London. As in Dr. Clifton's series, in London also, there was one case of surgically induced tricuspid deformity leading to ventricular fibrillation and death.

6. Anomalous veins of all sorts are easily dealt with. With hypothermia, attempts to deal with these often result in pulmonary infarction.

7. Severe pulmonary hypertensive cases are operable by the well method without prohibitive mortality. Many such cases were seen at the Mayo Clinic, and one has been done here recently. Such cases almost all die when done with hypothermia.

8. Two common criticisms, that it is a blind method and difficult to achieve technical expertness, are not valid.

[1] *Bull. Wld Hlth Org.*, 1959, 21: 51.
[2] *Tubercle (Lond.)*, 1957, 38: 375.
[3] *Tubercle (Lond.)*, 1955, 36: 238.
[4] *Lancet*, 1957, 2: 871.
[5] *Tubercle (Lond.)*, 1959, 40: 453.
[6] *Bull. Un. int. Tuberc.*, 1957, 27: 254.
[7] *Brit. med. J.*, 1960, 1: 161.

Since K. N. Morris' introduction of the use of a simple test-tube to see each step of the procedure, the method cannot be called a blind one. The procedure has been found a simple one, and the technique was found very easy to master.

Yours, etc.,

Cardiac Surgeon,
Royal Children's Hospital,
Melbourne.
April 27, 1960.

GEORGE WESTLAKE.

WHAT EVERY NURSE SHOULD KNOW.

SIR: Some time ago I had an operation for cataract. When I entered hospital I was aware that the prostate would require attention later. Some time after I recovered from the anæsthetic I had acute retention of urine. It was Saturday afternoon, and doctors had gone to golf, to bowls, to tennis, to the races or for a drive to the country. My urologist was out of town.

As the pain caused by the over-distension of the bladder increased, the nursing staff seemed helpless. Finally, a New Australian sister entered the room and volunteered the comment: "I have passed catheters on men hundreds of times at the Urological Clinic in Vienna, but here I am not allowed. I would get into trouble. I must not do it."

This was not very comforting, so I said: "Since you are able to give me relief, please do so at once." Still she refused. Eventually, my groans and a request to speak to the Mother Rectress caused her to change her mind. My gratitude for the relief from pain which she gave me knew no bounds. Later, my urologist approved entirely of what she had done.

This experience forcibly drew my attention to a serious omission in the teaching of the ways in which a nurse may reasonably be expected to help a patient in an emergency. A nurse is allowed to give a male adult an enema to empty the lower bowel. Why should she be prohibited from passing a catheter on a male adult to empty the bladder?

In every teaching hospital every nurse, before she is given her qualifying certificate, should be taught how to pass a rubber catheter on a man. If she does it successfully only once, she will acquire the necessary confidence. Nurses can be trusted to be gentle and to take strict aseptic precautions. In big hospitals there is usually some patient who has to be catheterized regularly, so the opportunity to teach should not be missed.

Since returning to work I have spoken to several nursing sisters. They regret their inability to carry out such a simple procedure. I have discovered that nurses who train in country hospitals have a better opportunity of learning than those who train in the city. All these women to whom I have spoken emphatically agree that every nurse should know how to pass a catheter on a man.

I am certain that I will be supported by the medical profession generally when I urge all those responsible for the training of nurses to rectify this minor deficiency in their course of instruction.

Yours, etc.,

April 20, 1960. M.D., F.R.C.S.

GENERAL PHARMACEUTICAL BENEFITS.

SIR: At the age of 41 I left the regulation-controlled National Health Service in the United Kingdom and came to Australia in the expectation of a freer and fuller medical life, in which I might practise medicine rather than the art of seeing as many patients as demanded my services in as long a time each as I dared give them concomitant with the necessity of seeing all the others.

I am in a dispensing practice and find that I have as little recreative time as I ever had in the United Kingdom, thanks to the demands the Pharmaceutical Benefits Scheme puts on my evenings.

I am hoping and praying that this new incursion into my freedom to treat as I wish is not going to be allowed to be the thin end of the wedge.

The iron of the National Health Scheme sears the soul of the general practitioner in Great Britain, and unless he has no conscience he must get out. This now threatens us all in Australia, my new home. I would, as yet, not consider myself as anything but freer here; but we are in danger.

The fate of medicine, especially that of the general practitioner, is in my view liable sooner or later to pass out of our own hands into those of the Civil Servants. Worthy though these may be, they will fast become not our servants, but our masters.

I and many others have had some of this thing. Be warned and stand fast now! Tomorrow may be too late.

Yours, etc.,

Brinkworth, S.A.
April 24, 1960.

R. WILSON WILLIAMS.

SIR: I would like to write in affirmation of Dr. Wilson's letter (MED. J. AUST., April 23, 1960), and I would suggest that Federal Council decide that a letter, addressed to Dr. Cameron, be mailed so as to be delivered in Canberra on June 24, 1960, stating that, on Friday, July 1, 1960, medical practitioners will destroy their plastic-covered booklets, and as from that date will write their prescriptions in duplicate.

This, I feel, would be a perfect solution to the problem, thereby allowing the Government to subsidize the supply of drugs to whatever extent they wish, while in no way interfering with the patients' ability to secure the aforementioned free drugs. Perhaps, in this way, we may become doctors once again.

It is my considered opinion that if the present situation is allowed to proceed unchallenged, any form of professional regimentation whatever will be possible in the future.

Yours, etc.,

457 Punchbowl Rd.,
Belfield, N.S.W.
Undated.

MAXWELL G. CHAPMAN.

SURGERY AND THE GENERAL PRACTITIONER AND PROFESSIONAL UNITY.

SIR: The purpose of writing is to remind members of the profession throughout Australia, soon to be banded together in an Australian Association, of the wisdom of our traditional policy of maintaining our outward unity even though there may be, and should be, free and democratic discussion of all contentious issues within the profession. Unless the present trend towards fragmentation is arrested now, in its very infancy, the Australian Medical Association may well find itself trying unsuccessfully to represent several diverging groups from its very inception. The experience in England, where this dangerous division of aims and leadership allowed the profession to fall under the yoke of the Government, should cause every one of us to resolve that, however great the provocation, we will make whatever sacrifices are necessary to preserve our unity and speak with a common voice on all medical matters.

The wide public of the leading newspapers and their possibilities for furthering some sectional interest present a strong temptation, and unfortunately there are among us those who lack the strength to withstand this temptation.

It should be realized by all doctors that, as far as the public is concerned, we are all the one group, and any act or word which diminishes the public respect for one section of the profession must lower the general standing of the whole. For this reason it is very difficult to understand, much less condone, the action of medical men in writing or encouraging newspaper articles which tear down one section of the profession in the mistaken hope that it will increase the standing of their own group. It will be readily agreed that successful medical care depends largely upon confidence of the patient in his doctor.

In recent weeks there have been two examples of this weakening of ethical standards. The first was the series of articles in *The Sydney Morning Herald* on our hospitals. The writer was anonymous, but it was more than obvious that his source of inspiration was very closely connected with Royal Newcastle Hospital. The hospital must be congratulated on inducing such a vociferous advocate of free enterprise to devote so much space to advertising Newcastle Hospital and its system—a type of partially socialized medicine. Without discussing these articles, the weaknesses of which are obvious to the profession if not to the public, it is clear that their result must be to lower the public estimation of nurses, doctors and hospitals.

The second appeared in this week's *Australian Women's Weekly*, which has a circulation of 800,000 and is probably

seen by 1,500,000 people, and is the most damaging blow which I have ever seen directed at the profession. The writer, "a highly qualified specialist", "for professional reasons" had to remain anonymous but devoted a page to an attack on general practitioners performing any surgery at all, even tonsillectomy. Reading between the lines I presume that the writer is a recently returned surgeon, inflated on return by "multiple diplomatosis', and now deflated by the prospect of years of low income until his practice builds up. There is no doubt that there are a few general practitioners who operate on inadequate indications and when they have not the requisite skill. However, we all know that there are holders of fellowships who also operate unnecessarily, and the mere possession of a higher degree does not make a man technically competent to perform major surgery. A much wiser approach to the problem will be to carry on the scheme initiated by the Australian College of General Practitioners to provide general practitioners with basic surgical training. To reply adequately to statements in this childish article would take a great deal of space, and it is with general principles that I am concerned. However, I can assure our anonymous "specialist" friend that there are logical answers to the points he raises.

"Professional reasons" do not prevent a man using his name in THE MEDICAL JOURNAL OF AUSTRALIA, and I hope but do not expect that a petulant young man who feels strongly enough to lower the reputation of general practitioners, the British Medical Association and the Australian College of General Practitioners before about 1,500,000 Australians will also feel strongly enough to reply to this letter over his own name in your correspondence columns.

It is not, however, to these two articles I mainly wish to draw attention. I wish only to see the profession maintain its unity, its only protection against the many hostile forces which threaten it. The general principle of using the medical journals to express opinions and allowing evolution and intraprofessional agitation to produce improvements, as they are undoubtedly doing, has stood the test of many years. It would be a tragedy if the profession, on the verge of the greatest period of healing which the world has seen, should debase itself before the general public in these unwarranted, exaggerated and foolish articles.

Yours, etc.,

2 Palla Street,
Griffith,
N.S.W.
April 29, 1960.

F. L. LONG.

SIR: I feel, as no doubt most practising general practitioners do, that Dr. W. D. Jackson in his letter (MED. J. AUST., April 16, 1960) has drawn attention to an insidious move on the part of a section of the profession to look after itself at the expense of its colleagues. There can be no doubt as to the ultimate intention of this group—to exclude any doctor who does not possess an F.R.C.S. from the practice of surgery. The reason is quite plain—the profession is becoming overcrowded with young "specialists", particularly in surgery, and the College of Surgeons is worried because there is not enough work to go around.

I see no reason why capable general practitioner surgeons should sacrifice this part of their work just to provide jobs for the surplus of young technicians with academic qualifications. As Dr. Jackson has clearly stated, neither he nor any other competent general practitioner wishes to be stripped of all initiative and status. This is precisely what happened in England, and the same sectional group was responsible. Now we find the disgraceful situation in which the patient in the United Kingdom with a hernia is obliged to wait over twelve months for surgery if he elects to go on the waiting list, but of course he can have it done privately in no time if he pays the "specialist surgeon" private fees.

Surely the College of Surgeons does not think that the only doctor competent enough to remove an appendix or do an ectopic is one with an F.R.C.S. If so, it is high time that the College grew up. Of course there is bad surgery done by some general practitioner surgeons; there is also a lot of very good surgery too, and do not for a moment let us forget that the general practitioner surgeon does not hold a monopoly on all the bad surgery.

A far more constructive approach would be to forbid absolutely, to any doctor, specialist status in any branch of medicine or surgery, until he had done at least five years in general practice. Perhaps we would then see a more mature and less selfish attitude on the part of our "professional planners", and the possibility of the whole profession being sold to the public service, as it was in England, would cease to exist.

Yours, etc.,

Kerang,
Victoria.
April 21, 1960.

HUGH T. MCDONALD.

SIR: The article headed "The Menace of the Untrained Surgeon" in the *Australian Women's Weekly* of May 4 is so palpably misleading and discourteous to our profession that it does not, I feel, warrant detailed rebuttal in these columns. However, I do suggest that the writer should announce his identity in this journal and allow us to direct any criticism to him personally.

Yours, etc.,

385A Miller Street,
Cammeray.
April 28, 1960.

PAUL CAMBOURN.

BLOOD TRANSFUSION AND THE PATIENT'S CONSENT.

SIR: Your leader of April 23, 1960, was of particular interest to me, in view of an alarming experience during the early part of this month. I was called to see a woman, a member of the Jehovah's Witness sect, who had been in labour 40 hours, some eight hours in strong labour, without advancement. She had had Cæsarean section with a previous pregnancy only a matter of 15 months before; she was showing signs of maternal distress, and her hæmoglobin value was only a little over 66%. Uterine rupture (confirmed at operation) was imminent. She had had no medical supervision for the last 26 hours.

It was clear that immediate operation was necessary, and the need for blood transfusion and the grave risks involved in withholding blood were pointed out to the patient and her husband. However they were adamant in their view regarding transfusion, and the patient stated that were she to die, it was the will of God.

My anæsthetist was all for giving a transfusion during the operation. I felt I should do all I could for the woman and her baby without prejudice to her religious beliefs. This was a complicated case, and fraught with danger, but, as it happens, with a highly successful outcome. I can now smugly feel that my calculated risk was more than justified. However, what heart searchings would be felt if the patient and/or her baby were now dead!

Yours, etc.,

Tudhoe Street,
Wagin,
Western Australia.
April 30, 1960.

GERALD CLAYTON.

BLUEPRINT FOR A MODEL PSYCHIATRIC HOSPITAL.

SIR: I read Dr. Williams' letter (February 27, 1960) with interest, and would like to make a few comments about it. He stated that he was commenting upon two papers written by Dr. Maddison and myself published on January 9, 1960. However, although I agree with many of Dr. Maddison's thoughts, I would not go along with some of his gloomy prognostications or even with the emphasis he places on some aspects of his paper. Nevertheless, Dr. Williams seems to have fused the two adjacent articles together in content and missed the point of my paper—viz., the need for a close working association of the psychiatrist with the general hospital, the community and the general practitioner in his treatment of the patient's physical and mental illnesses. The lack of this was essentially what Dr. Williams seems to be mourning.

From his remarks, it seems that Dr. Williams thinks mainly in terms of teaching hospitals in urban areas, and his comments about the value of psychiatric units in such places are appropriate. I thoroughly agree with these remarks in relation to the education of future general practitioners. However, plans for the distant future do nothing to aid the individual patient and his doctor in the present and immediate future, particularly when the psychiatric facilities of the large country towns and cities are spread thinly or indeed even non-existent.

Therefore, even though I, like Dr. Williams, regret the creation of bureaucracy, I believe that the State should

provide a needed service which has not been established by other means. In this way both the individual patients and their doctors can be provided with means to deal with the existing problems by having the psychiatrist in his role as a readily available consultant. And by this close association much can be done to increase the understanding of the patients' mental disorders by the general practitioner and his better handling of the problems which occur. This was achieved in the "Worthing Experiment" to which I referred in January.

Yours, etc.,

JOHN M. WOODFORDE.

2423 Panama Street,
Philadelphia 3,
Pennsylvania, U.S.A.
April 25, 1960.

Notes and News.

International Congress of Rheumatology.

The Czechoslovak Society of Physical Medicine announces that an International Congress of Rheumatology will be held in Piest'any, Czechoslovakia, on September 21 to 25, 1960. Papers will be read by leading research workers from Bulgaria, Czechoslovakia, Denmark, Finland, France, Germany, Great Britain, Hungary, Italy, Norway, Poland, Rumania, the Soviet Union, Sweden and the United States of America. Special attention will be paid to rheumatoid arthritis and ochronotic arthropathy. Proposed communications (maximum eight to ten minutes) must be submitted to the Secretariat of the Congress as soon as possible. There will be a number of social functions in connexion with the Congress. Further information may be obtained on application to the Secretariat of the Czechoslovak Congress of Rheumatology, Praha 2, Na slupi 4.

International Congress of the History of Medicine.

The seventeenth International Congress of the History of Medicine, which is being arranged by the *Société internationale d'Histoire de la Médecine*, will be held on September 4 to 14, 1960, at Athens and Cos, Greece. The subjects for discussion are as follows: (i) Hippocrates and his school; (ii) the school at Alexandria; (iii) Byzantine medicine; (iv) a few other subjects, which will be accepted provided that they concern Greek medicine. Information regarding the Congress may be obtained from the General Secretary, Dr. F. A. Sondervorst, at 124, Avenue des Alliés, Louvain, Belgium. Early application should be made for membership of the Congress.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE following additions and amendments have been made to the Register of Medical Practitioners for New South Wales, in accordance with the provisions of the *Medical Practitioners Act*, 1938-1958.

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1) (a) of the Act: Adam, Bruce Douglas, M.B., B.S., 1958 (Univ. Sydney); Barrett, John William, M.B., B.S., 1945 (Univ. Melbourne); Bissett, Russell Lawrence, M.B., B.S., 1957 (Univ. Melbourne); Hayes, Ross Abbott, M.B., B.S., 1945 (Univ. Melbourne), M.C.P.A., 1946; Hosking, Frances Ann, M.B., B.S., 1956 (Univ. Queensland); Malatt, George Francis, M.B., B.S., 1957 (Univ. Melbourne); Parker, Dorothy Margaret, M.B., B.S., 1957 (Univ. Melbourne); Ritman, Teunis Hendrik, M.B., B.S., 1958 (Univ. Melbourne); Smith, Edward Durham, M.B., B.S., 1948 (Univ. Melbourne), F.R.A.C.S., 1956; Thiel, Ronald Ernest, M.B., B.S., 1958 (Univ. Queensland); Toyne, Albert Howard, M.B., B.S., 1944 (Univ. Melbourne), F.R.C.S., (England), 1955; Urban, Marianne, M.B., B.S., 1958 (Univ. Adelaide).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1) (b) of the Act: Bass, Diana Josephine, M.B., B.S., 1953 (Univ. London), M.R.C.S. (England), L.R.C.P. (London), 1953; Bass, Peter, M.B., B.S., 1949 (Univ. London); Cousins, John Ritchie, B.M., B.Ch., 1956 (Univ.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED APRIL 9, 1960.[1]

Disease	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	..	..	..	..	..	..	..	..	..
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	1(1)	..	..	..	7	..	8
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	3(3)	5(5)	..	..	..	..	1	..	9
Diphtheria	..	..	..	..	..	..	..	..	..
Dysentery (Bacillary)	..	..	1	..	2(2)	..	5	..	8
Encephalitis	1(1)	..	..	1(1)	..	..	..	..	2
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	38(8)	33(18)	4(2)	7(3)	5	1(1)	3	91	
Lead Poisoning	..	..	5	..	..	..	..	..	5
Leprosy	..	..	..	..	..	..	..	..	..
Leptospirosis	1	..	4	..	..	..	..	..	5
Malaria	..	..	..	..	..	..	..	..	..
Meningococcal Infection	1	1(1)	..	..	1	..	..	..	3
Ophthalmia	..	..	..	..	2	..	..	..	2
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	..	..	..	..	..	..	..	..	..
Puerperal Fever	..	..	..	..	..	..	..	..	..
Rubella	..	8(4)	..	2(1)	5(3)	..	..	..	15
Salmonella Infection	..	..	..	..	..	..	..	..	..
Scarlet Fever	5(2)	9(7)	..	9(2)	2(1)	2(2)	..	..	27
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	2(2)	1	..	..	..	..	..	3
Trachoma	..	..	..	..	1	..	9	..	10
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	45(28)	10(8)	48(12)	5(5)	10(6)	2(1)	..	..	120
Typhoid Fever	..	1(1)	..	..	..	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne)	..	..	1(1)	..	..	..	..	..	1
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

Figures in parentheses are those for the metropolitan area.

Oxford); Coulthard, Janet, M.B., B.Ch., 1948 (Univ. Wales); Cremin, Bryan Joseph, M.B., B.S., 1952 (Univ. London); Floyd, Anthony Francis, M.B., B.S., 1954 (Univ. London); Laidlaw, Matthew, M.B., Ch.B., 1923 (Univ. Glasgow); Murray-Alston, Michael, M.B., B.Ch., 1957 (Univ. Dublin); Pratt, Vincent James, M.B., B.S., 1957 (Univ. London), M.R.C.S. (England), L.R.C.P. (London), 1957; Rundle, George Arnold, M.R.C.S. (England), L.R.C.P. (London), 1945.

The following have been issued with a licence according to Section 21A of the Act: Polner, Rudolph Rezso, Barellan Region, for one year from April 16, 1960; Wanke, Siegfried, Sofala Region, for one year, from April 15, 1960; Colja, Michael, Bogan Gate Region, for one year from March 1, 1960.

The following have been issued with a licence according to Section 21C (4) of the Act: Buivids, Antons, Bankstown District Hospital, issued on April 9, 1960; Verbok, Geza, Armidale and New England Hospital, issued on March 23, 1960; Lezynska, Alicja, Lithgow District Hospital, issued on March 23, 1960; Hornitzky, Jaraslav, as Assistant to Dr. Andrew Jennings Harker, Dr. Hector Ernest Maderna, Dr. Jean Milne Lark, and Dr. Peter Taylor Frost, of 41 Smart Street, Fairfield, issued on March 7, 1960; Hidi, Madelaine, Liverpool District Hospital, issued on March 23, 1960; Kaufman, Mieczyslaw, Lithgow District Hospital, issued on March 23, 1960.

The following have been issued with a licence under Section 21C (3) of the Act: Szabo, Denes, Balmain District Hospital, issued on March 11, 1960; Lin, Michael Fen Chong, Balmain District Hospital, issued on March 17, 1960.

QUEENSLAND.

THE following have been registered, pursuant to the provisions of Section 19 (1) (a) (d) of *The Medical Acts*, 1939 to 1958, of Queensland: Mashford, Maurice Laurence, M.B., B.S., 1953 (Univ. Sydney), M.R.A.C.P., 1957; Peck, John Portway Saville, M.R.C.S., England, L.R.C.P., London, 1933, B.Chir., 1934 (Univ. Cambridge), M.B., 1936 (Univ. Cambridge); Hood, John William, M.B., B.S., 1955 (Univ. Melbourne); Gorman, Richard Francis, M.B., B.S., 1955 (Univ. Melbourne); McLaughlin, John Mannix, M.B., B.S., 1952 (Univ. Sydney), D.L.O., R.C.P., London, R.C.S., England, 1959; Holme, John Leicester, M.B., B.S., 1939 (Univ. Sydney), D.C.P., London, 1950, M.C.P.A., 1957.

Notice.

VICTORIAN LAENNEC SOCIETY.

A MEETING of the Victorian Laennec Society will be held on Tuesday, May 24, 1960, at 8.15 p.m., in the lecture theatre, Nurses' Home, St. Vincent's Hospital, Melbourne. The subject will be "Cor Pulmonale", and the speakers Dr. A. J. Goble and Dr. K. F. Fairley. All members of the British Medical Association are invited to attend.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Dight, Ronald, M.B., B.S., 1959 (Univ. Sydney).

Frommer, John Eugene, M.D., 1934 (Univ. Pisa), licensed under Section 21A of the *Medical Practitioners Act*, 1938-1958 (Cassilis region), Cassilis, N.S.W.

The undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Woods, Arthur Frederick, M.B., B.S. (Univ. Adelaide), Queen Victoria Hospital, Melbourne.

Deaths.

THE following deaths have been announced:

WHEATLAND.—Frank Travis Wheatland, on April 10, 1960, at Melbourne.

BYRNE.—Vincent Charles Byrne, on April 26, 1960, at Brisbane, Queensland.

BEGG.—William Begg, on April 29, 1960, at Melbourne.

HINRICHSEN.—William Henry Hinrichsen, on April 30, 1960, at Balwyn.

Diary for the Month.

MAY 16.—Victorian Branch, B.M.A.: Finance Subcommittee.
MAY 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MAY 18.—Victorian Branch, B.M.A.: Clinical Meeting (Queen Victoria Hospital).
MAY 19.—New South Wales Branch, B.M.A.: Clinical Meeting.
MAY 19.—Victorian Branch, B.M.A.: Executive of Branch Council.
MAY 20.—New South Wales Branch, B.M.A.: Ethics Committee.
MAY 24.—New South Wales Branch, B.M.A.: Hospitals Committee.
MAY 25.—Western Australian Branch, B.M.A.: General Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations, other than those normally used by the Journal, and not to underline either words or phrases.

Authors of papers are asked to state for inclusion in the title their principal qualifications as well as their relevant appointment and/or the unit, hospital or department from which the paper comes.

References to articles and books should be carefully checked. In a reference to an article in a journal the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of article. In a reference to a book the following information should be given: surname of author, initials of author, year of publication, full title of book, publisher, place of publication, page number (where relevant). The abbreviations used for the titles of journals are those of the list known as "World Medical Periodicals" (published by the World Medical Association). If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this Journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

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